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ELECTIVE LOCALIZATION OF STREPTOCOCCI *

EDWARD C. ROSENOW, M.D.
ROCHESTER, MINN.

The general systemic distribution of micro-organisms in certain diseases with a localized focus is well established, but the factors which determine the localization of bacteria after they gain entrance into the circulation are obscure.

In this paper I wish to record a summary of the results obtained from the intravenous injection, under a standard technic, of streptococci isolated from appendicitis, ulcer of the stomach and duodenum, cholecystitis, rheumatic fever, erythema nodosum, herpes zoster, epidemic parotitis, myositis and endocarditis, and to discuss the bearing of these results on localization of streptococci.

TECHNIC

The streptococci were usually grown from sixteen to twenty-four hours at 37 C. in tall columns of ascites (10 per cent.) dextrose (0.2 per cent.) broth (0.6+ to 0.8+), to which sterile tissue (guinea-pig kidney or heart muscle) was often added; the sterility of the ascites fluid and broth containing the tissue was always proved beforehand. After incubation smears were made, the cultures were centrifuged in the containers in which they were cultivated,[1] the supernatant fluid was decanted and the sediment suspended in sodium chlorid solution so that 1 c.c. of the suspension contained the growth from 15 c.c. of broth. The doses for rabbits (ear vein) were usually from 0.5 to 3 c.c., and for dogs (leg vein) from 1 to 5 c.c. of this suspension. The injections were made quite rapidly through a rather fine needle (22 gage), usually within an hour after the suspension was made. Blood agar plate cultures were made at the time the suspensions were injected to study the character of the organisms, to test their viability and to save them from further study. This is an important precaution because negative results have at times proved to be due to early death of the recently isolated organisms in the broth cultures. In the accompanying table, "when isolated" indicates the first or second and, occasionally, the third or fourth cultures, or the first culture after one animal passage. "Later" indicates that the strains were cultivated for a week or longer. "After animal passage" indicates usually from the second to the sixth animal passage.

The strains tested from appendicitis, ulcer of the stomach, cholecystitis, rheumatic fever, erythema nodosum, myositis and endocarditis include strains isolated from the characteristic lesions as well as from the apparent atrium of infection. Those from herpes zoster were from the tonsils and spinal fluid, and those from epidemic parotitis were obtained by catheterizing Steno's duct and from the tonsils. The strains from miscellaneous sources were usually from tonsils approaching the normal condition; and the laboratory strains were streptococci or pneumococci cultivated on artificial mediums for a long time and had lost all apparent virulence. The figures in the lowest line of the table represent the average percentage incidence of lesions in individual organs following injection of various strains of streptococci except those from the specific disease. Thus the first figure indicates that 5 per cent. of the animals, injected with the various strains except those from appendicitis, showed lesions in the appendix.

Care was exercised to obtain growths from the depths of the supposed primary focus with as little contamination from the surface as possible, the cultures being made from the material expressed from the tonsils or from emulsion of extirpated tonsils after thorough washing in sodium chlorid solution. The material from the depths of pyorrheal pockets was obtained by means of a pipet.

For the study of pathogenicity of the cultures, dogs and rabbits were chiefly used, being killed with chloroform at the desired time, usually in from twenty-four to forty-eight hours. Postmortem examinations were always made as soon after death as possible. A thorough inspection in a bright light with the unaided eye or with the aid of a hand lens was made for focal lesions. The exact character of the lesions and the presence of the streptococci in each of the various diseases have been determined by microscopic study of sections. Cloudy swelling is not included in the results given in the table. Hemorrhage, localized necrosis, exudation and infiltration were the usual lesions. Thus, in case of the joints, hemorrhage about the joint or turbidity of fluid, as determined with a pipet, or both, were considered as evidence of arthritis. Hemorrhages in the pericardium and turbidity of pericardial fluid, due to leukocytes, were considered as evidence of pericarditis. The postmortem study of animals often symptomless is essential to obtain accurate knowledge of the pathogenicity of a culture, and must supplant the older method of merely finding out whether a culture produces death or not, a method still too much in vogue. The table includes data only from those animals in which the postmortem was comprehensive, and does not include some of the earlier experiments, especially on endocarditis.

* From the Memorial Institute of Infectious Diseases, Chicago, and the Mayo Foundation, Rochester, Minn.

1. The common 8-ounce nursing bottle is used both as a culture flask and centrifugal tube, and serves the purpose admirably.

Increase in mortality rate, earlier death and greater degree and distribution of lesions following standard dosage were considered as proof of high virulence. Changes in the spleen and liver were so rare following injection of the strains as isolated, except those from cholecystitis, that they are not included in the table. Acute splenitis and such changes in the liver as focal necrosis, parenchymatous and bile duct hemorrhages and acute degeneration with marked acidity occurred, however, after the strains had acquired greater virulence from animal passage. In the earlier experiments not sufficient attention was paid to the occurrence of lesions in the thyroid, thymus, suprarenals and lymphatic glands. Later a closer search for lesions in these structures was made, especially after it was found that lesions in the thyroid followed intravenous injection of bacteria isolated from goiter. It must be said, too, that strains of streptococci from rheumatic fever, myositis and cholecystitis produce hemorrhages in the thyroid quite commonly, while those from other sources rarely produce them.

ELECTIVE LOCALIZATION OF STREPTOCOCCI

Source of Streptococci		Strains (220)	Animals Injected (833)	Percentage of Animals Showing Lesions in															
				Appendix	Stomach Hemor.	Duodenum Ulcer	Gallbladder	Pancreas	Intestines	Joints	Endocardium	Pericardium	Myocardium	Muscles	Kidney	Lung	Skin	Tongue	Eye	Parotid
Appendicitis	When isolated	14	68	**68**	6	1	1	0	9	29	21	0	9	12	0	0	0	0	3	0
	Later	8	26	15	19	15	4	0	0	22	19	0	12	23	0	0	0	0	0	0
	After animal passage	7	22	45	45	30	40	0	20	36	20	0	20	25	10	0	0	0	0	0
Ulcer of stomach in man	When isolated	18	103	2	**60**	**60**	20	3	7	16	12	4	5	0	5	0	0	0	0	0
	Later	8	22	5	5	0	5	0	0	18	14	0	0	0	0	0	0	0	0	0
	After animal passage	7	39	0	23	33	30	15	15	21	5	0	3	3	8	15	0	0	0	0
Cholecystitis	When isolated	12	41	0	29	15	**80**	5	17	17	10	0	2	7	5	5	2	0	0	0
	Later	5	14	14	28	14	7	0	0	21	14	0	0	0	7	0	0	0	0	0
	After animal passage	4	16	0	31	13	56	19	13	25	19	0	13	0	13	6	0	0	0	0
Rheumatic fever	When isolated	24	71	8	23	18	3	3	13	**66**	**46**	**27**	**44**	27	39	4	6	0	10	0
	Later	8	14	0	14	21	0	0	0	21	21	0	28	0	21	0	0	0	0	0
	After animal passage	5	19	21	37	21	5	21	0	37	53	32	37	16	42	21	0	0	11	0
Erythema nodosum	When isolated	6	20	0	10	0	0	0	5	20	20	10	0	35	10	5	**90**	0	5	0
	Later	3	9	0	22	0	11	0	0	11	11	0	0	0	0	0	22	0	0	0
	After animal passage	6	14	0	21	0	50	0	7	50	14	7	14	50	7	43	43	0	0	0
Herpes zoster	When isolated	11	61	10	29	8	16	2	8	11	5	11	5	11	5	21	**70**	15	15	0
	Later	6	15	0	13	7	7	13	7	60	7	0	20	40	7	20	7	0	13	0
	After animal passage	4	7	0	28	10	0	0	0	43	0	14	0	28	0	43	28	14	0	0
Mumps	When isolated	9	19	15	21	5	21	42	10	42	15	0	37	3	5	15	15	0	0	**73**
	Later	5	8	12	0	0	0	12	12	24	24	0	12	12	0	12	12	0	0	24
Myositis	When isolated	3	40	2	4	10	2	7	7	20	10	0	**35**	**75**	2	0	7	0	8	0
Endocarditis	When isolated	8	44	0	7	0	5	0	15	15	**34**	4	20	0	20	20	2	0	0	0
Miscellaneous	When isolated	34	41	3	17	0	4	0	4	17	20	0	15	7	7	7	0	0	0	0
"Lab." strains	Before and after animal passage	5	100	2	18	5	2	2	2	45	49	0	15	12	10	17	2	0	6	0
Average percentage of animals injected with nonspecific strains showing lesions in individual organs				5	20	9	11	6	8	27	14	2	10	12	9	11	2	1	3	0

RESULTS

A study of the table shows that streptococci from the various diseases often have a most striking affinity or tropism for the organs or tissues from which they are isolated. Thus, fourteen strains from appendicitis produced lesions in the appendix in 68 per cent. of the sixty-eight rabbits injected, which is in marked contrast to an average of only 5 per cent. (given in lowest line of table) of lesions in the appendix in the animals injected with the strains as isolated from sources other than appendicitis. Eighteen strains from ulcer of the stomach or duodenum produced hemorrhages in 60 per cent. and ulcer of the stomach or duodenum in 60 per cent., a combined total of 74 per cent. of the 103 animals injected, in contrast to an average of 20 per cent. hemorrhages and 9 per cent. ulcer following injection of other strains. Twelve strains from cholecystitis produced lesions in the gallbladder in 80 per cent. of the forty-one animals injected, in contrast to an average incidence of lesions here of only 11 per cent. with the other strains. Twenty-four strains from rheumatic fever produced arthritis in 66 per cent., endocarditis in 46 per cent., pericarditis in 27 per cent., and myocarditis in 44 per cent. of the seventy-one animals injected, in contrast to an average of arthritis in 27 per cent., endocardial lesions in 14 per cent., pericarditis in 2 per cent. and myocarditis in 10 per cent. of the animals injected with strains

from sources other than rheumatic fever. Six strains from erythema nodosum produced lesions of the skin in 90 per cent. of twenty animals injected, in contrast to an average of 2 per cent. in the animals injected with the strains from sources other than erythema nodosum and herpes zoster. Eleven strains from herpes zoster produced herpetiform lesions of the skin, lips, tongue or conjunctivae in 77 per cent. of the sixty-one animals injected, in contrast to the average of only 1 per cent. of what seemed to be herpes of the skin with the other strains. Nine strains of streptococcal organism from epidemic parotitis produced lesions in one or both parotid glands in 73 per cent. of the nineteen animals injected intravenously, in contrast to no instance of lesions here with the other strains. Three strains from cases of true myositis produced myositis in 75 per cent. and myocarditis (chiefly of the right ventricle) in 35 per cent. of the forty animals injected, in contrast to an average of myositis of 12 per cent. and myocarditis of 10 per cent. following injection of strains from sources other than myositis or rheumatic fever; and eight strains of *Streptococcus viridans* from chronic septic endocarditis produced lesions in the endocardium in 84 per cent. of the forty-four animals injected, in contrast to an average of 15 per cent. with the strains other than those from endocarditis. The results following injection of the miscellaneous strains (usually the first culture from tonsils) and the laboratory strains serve as a basis of comparison with those following injection of the strains from the various diseases, and correspond roughly with the total average incidence of lesions in the various organs as given in the lowest line of the table.

While the incidence of lesions in the organs following injection of the strains isolated from such organs is high, as shown by these figures, the appearances at the necropsy are even more significant. In many instances in which the animals survive the injection for some time, no other focal lesions could be found except those in the organ in question; and when the animal died early, these lesions were the marked feature and the associated ones were relatively insignificant. Frequently the injection of a very small dose was sufficient to prove the elective localization. This elective property was shown not only by the cultures from tissues and foci but also by the bacteria contained in the foci, directly injected in other animals.

In many cases of both acute and chronic diseases the apparent atrium of infection was found to harbor streptococci having elective affinity; in the former usually only at the time of the attack, in the latter in some instances for months. The elective affinity, however, was less marked in the strains isolated from the supposed focus than in the strains isolated from the lesions in the various organs. The rather wide range of lesions, as indicated in the table, following the injection of the strains from herpes zoster and parotitis is due to the fact that often primary mixed cultures from tonsils and pyorrheal pockets were injected.

Attempts to find a method which would preserve the original tropic property, while only partially successful, have shown that it may be preserved for some weeks in the deeper colonies of the original shake cultures and for as long as seven months by keeping the suspensions containing sterile tissue in the ice chest, thus maintaining the bacteria in a condition of latent life.

The localization of the strains from appendicitis, ulcer of the stomach and cholecystitis as isolated, after cultivation and after animal passage, is of particular interest and will be discussed in a separate paper. It should be stated here, however, that these strains resemble one another very closely indeed in cultural and other respects. Those from appendicitis are the least virulent, those from ulcer occupy a middle position and those from cholecystitis are the most virulent. The virulence seems to be one of the factors that determines their place of survival after intravenous injection. Now if the localization is dependent to a certain extent on virulence, then the occurrence of ulcer and cholecystitis should become greater as the strains from the appendix are passed through animals, and appendicitis should occur oftener after the strains from ulcer and cholecystitis lose virulence from cultivation on artificial mediums. This is found actually to be the case (see figures in table). In this connection other facts should be mentioned. None of the strains from appendicitis produced pancreatitis. The strains from ulcer and cholecystitis as isolated (mostly those from acute cases) produced pancreatitis in 3 per cent. and 5 per cent., respectively, of the animals injected. After animal passage, pancreatitis occurred in 15 and 19 per cent., respectively, while after cultivation on artificial mediums pancreatitis in no case was obtained.

Lesions in the intestines, exclusive of the duodenum, were more common with the strains from cholecystitis and rheumatism than with those from appendicitis, and all the strains produced intestinal lesions (chiefly of the mucous membrane and lymphoid structures) quite commonly after they had been passed through animals, whereas, after cultivation for a time, no noteworthy lesions were found in the intestinal tract.

The streptococci studied by me from parotitis resemble the organism described by Herb[2] and, like hers, produced the characteristic picture of mumps in dogs when injected into Steno's duct. Intravenous injection of these organisms produced marked edema and hemorrhage in and surrounding the parotid. The affinity was so great that the streptococci were found in pure culture in the enlarged parotid in three of five full-time puppies removed from the uterus of a dog which was chloroformed during a marked parotitis following injection into Steno's duct. Antigens prepared from a number of these strains were found to bind specifically complement in serum from parotitis (Howell).

Lesions in the skeletal muscles occurred in 75 per cent. of the animals injected. The number of lesions in the muscles and myocardium in the animals injected with strains from myositis was often in proportion to the quantity injected, and occurred mostly in the tendinous portion and in the right ventricle.

Lesions in the kidney were especially common after injections of streptococci from rheumatic fever (39 per cent.) and from endocarditis (20 per cent.). These occurred chiefly in the medullary portion (Rosenow[3]) in the former and in the glomeruli in the latter.

Lesions in the lung, consisting usually of hemorrhages and edema, were rare following injection of the strains when isolated and after they were cultivated on artificial mediums but, just as was found previously (Rosenow[3]) they occurred oftener after the virulence was increased by animal passage.

That the streptococci are the underlying cause of the diseases from the lesions of which they were iso-

2. Herb, Isabella C.: Experimental Parotitis, Arch. Int. Med., September, 1909, p. 201.

3. Rosenow, E. C.: Experimental Infectious Endocarditis, Jour. Infect. Dis., 1912, xi, 210; Immunological Observations in Staphylococcus and Pneumococcus Endocarditis, ibid., 1909, vi, 245; Transmutations Within the Streptococcus-Pneumococcus Group, ibid., 1914, xiv, 1.

lated is indicated further by the fact that they have elective affinity for the corresponding structures in animals. Moreover, the fact that the same streptococcus may be made to localize in different organs is in consonance with the knowledge that streptococci may cause diseases with different symptomatology. The possibility, however, that they are secondary invaders to some ultramicroscopic, filterable organism has to be considered. Filtrates of the streptococcal cultures from various diseases were injected intravenously. In some instances the filtrates produced lesions in the organs from which the strains were isolated; the lesions, however, were not due to living organisms because the broth which was inoculated and incubated with the tissues failed to produce any lesions. The results, while inconclusive, may be said to indicate that streptococci produce substances which cause injury specifically in the tissues from which the strains are isolated.

GENERAL DISCUSSION

The results obtained are in harmony with the facts that (1) "septic sore throat" is due to streptococci having peculiar properties;[4] (2) certain epidemics of throat infection, due to streptococci, are more frequently complicated by sinusitis than others; (3) distinct differences in the character of the lesion in the lung and mortality rate in pneumonia, as shown by Cole,[5] are due to pneumococci so nearly alike as to require sensitive biologic tests to differentiate them; (4) hemolytic streptococci frequently have a marked affinity for joints, and (5) Friedländer bacilli in arthritis show elective affinity for joints in animals when other strains do not (Dick[6]). The "organotropic" condition of streptococci is analogous to the affinity of the tetanus toxin for the motor ganglion cells, of the diphtheria bacillus for the faucial tonsils, of the meningococcus for the meninges, of the pneumococcus for the lung, of the typhoid bacillus for lymphatic tissues, of the virus of rabies for the central nervous system, of the organism of anterior poliomyelitis for the anterior horns of the spinal cord, of the malarial parasite for the red blood corpuscle, and of the *Trichina spiralis* for muscles. The results, moreover, are in accord with the well-known fact that chemicals when injected intravenously also localize unequally in various organs.[7] The changes in the distribution of lesions as the streptococci are altered by cultivation on artificial mediums or by animal passage are similar to the changes in localization of various chemicals or dyes depending on chemical constitution, as observed by Ehrlich.[8] In my experiments advantage was taken of the opportunity afforded to study the nature of selective action from the standpoint of living bacteria.

Flexner[9] has shown that the functioning organ may be especially favorable to the growth of certain bacteria although the organ extracts may inhibit their growth; hence the growth of bacteria in various organs may be related to function and blood supply. Streptococci of low virulence but highly sensitive to oxygen are found to produce lesions in tissues whose blood supply and therefore oxygen and food requirements are low (heart valves, tendinous portion of muscles and the structures about joints). Streptococci of greater virulence are found to produce lesions in tissues whose blood supply and therefore oxygen and food requirements are high (kidney, lung, etc.); hence localization and production of injury seem to be closely related to the amount of available oxygen in a given tissue. The fact that lesions occurred far more frequently in the right ventricle (containing venous blood) than in the left ventricle (containing oxygenated blood) is in accord with this hypothesis. Might not the predisposing action of trauma (locus minoris resistentiae), of exposure to cold and of a drunken bout, to infection be best explained on the basis of lack of oxygen?

The changes observed, as hemorrhage, cloudy swelling and necrosis, from a purely chemical[10] as well as from a colloid-chemical[11] point of view, are identical with the changes of tissue asphyxia. I have found that pneumococci when grown and autolyzed under anaerobic conditions produce a much larger quantity of toxic material than when grown or autolyzed under aerobic conditions. Moreover, pneumococcus extracts proved to be toxic to warm-blooded animals (guinea-pigs), have the same inhibitory effect on the development of fertilized eggs of arbacia as does lack of oxygen. Since bacteria and their products are powerful reducing agents,[12] one of the chief effects of the bacteria and their products very likely is interference with the normal cell respiration, and possibly the greater the virulence the more powerful this interference.

Although the circulation is an important factor in determining localization, the tissues themselves play an even more important rôle. The question whether the lesions in the organ for which a particular strain appears to have elective affinity are due to the lodgment of a larger number of bacteria here than in the other organs, or whether the bacteria lodged in equal numbers in the various organs but survive only in the one showing lesions, is now under study. The evidence already obtained, however, points strongly to the former mechanism. It appears that the cells of the tissues for which a given strain shows elective affinity take the bacteria out of the circulation as if by a magnet—adsorption.

This remarkable tropic condition tends to disappear quite promptly both on cultivating the streptococci on artificial mediums and on passing them successively through animals, and this may occur without demonstrable changes in morphology, grouping or character

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11. Fischer, Martin H.: Edema and Nephritis, New York, John Wiley & Sons, 1915.

12. Smith, T.: Reduktionserscheinungen bei Bakterien und Beziehungen zur Bakterienzelle, nebst Bemerkungen über Reduktionserscheinungen in steriler Bouillon, Centralbl. f. Bakteriol. u. Parasitenk., Part 1, 1896, xix, 181.

of chain formation. I have previously shown[13] that the ability of *Streptococcus viridans* and staphylococci to produce lesions in the endocardium is due partly to physical clumping. Evans[14] has shown that the action of vital stains of the benzidin group is related to the size of colloidal particles. A careful study of smears of the suspensions injected in these experiments revealed no constant relation between localization and clumping or size of the bacteria.

Individual variations in resistance to infection were found in the injected animals. The effects of these conditions in the host as determining factors in localization are important; they are probably expressions of differences in metabolism, oxidation rates, etc., which influence the soil for bacteria. The tendency of virulent bacteria, temporarily or permanently, to render this soil less favorable for their growth is well established. There is some evidence, on the other hand, which goes to show that certain bacteria of very low virulence (commonly found in chronic foci of infection) tend actually to make this soil more favorable. But, in the light of my results, it must be considered that differences in the host may afford the peculiar type of reaction, or that the individual harbors a particular form of focus of infection which is favorable for bacteria to acquire elective properties. The following facts support the latter view: (1) the common occurrence of certain noncontagious diseases, such as herpes zoster, ulcer of the stomach, etc., during definite age periods; (2) the fact that foci of infection afford opportunity for bacteria to grow under varying grades of oxygen pressure and in mixed culture, both of which have been shown to cause changes in virulence and other properties of bacteria,[15] including the streptococcus group;[16] (3) the occurrence of systemic infections such as rheumatic fever, appendicitis, ulcer of the stomach, etc., usually after the acute symptoms in follicular tonsillitis (hemolytic streptococci), have subsided, and (4) the finding in the focus and involved tissues at the time of the systemic infection, streptococci having elective affinity for these structures in animals.

Since different bacteria may acquire simultaneously affinity for the same tissue, diseases which resemble each other more or less closely, such as the different forms of arthritis, may be due to bacteria of different species each having elective affinity for the particular structures involved.

The figures in the lowest line of the table represent the results of numerous experiments (833) with streptococci (220) from a wide range of sources, and may therefore be regarded as an index of the liability of the various organs to infection. Thus, joint lesions occurred more often (27 per cent.) than lesions in other organs, corresponding to the frequent occurrence of spontaneous arthritis in man and animals. The occurrence of lesions in the stomach (20 per cent.), valves of the heart (14 per cent.), myocardium (12 per cent.) and skeletal muscles (12 per cent.) correspond in a general way to the occurrence of infection in these organs in man. The very infrequent involvement of the skin, tongue and the parotid in the animals is in keeping with the rarity of embolic infections in these structures. The character of the lesions and their occurrence simultaneously in the joints, heart, muscles and kidney, and the development of chorea (7 per cent. mostly in young rabbits) following injection of the streptococci from rheumatic fever, parallels quite closely the phenomena of rheumatic infection as observed in man. The strains from erythema nodosum resemble those from rheumatic fever, producing a relatively high incidence of arthritis, pericarditis and myositis, a fact which supports the view held by clinical observers,[17] that the causative agents of rheumatic fever and erythema nodosum must be similar.

The tendency to localize electively within a limited range, "monotropism," is most highly developed in the relatively nonvirulent strains isolated from chronic lesions. In the more virulent strains from acute lesions and after animal passage, this tendency is less highly developed, the lesions occurring over a wider range, "polytropism." The fact that the elective property is more highly developed in streptococci isolated from the organ involved, than in those isolated from the probable focus of infection, is in accord with the results obtained by Forssner,[18] who showed that when streptococci are grown in kidney and kidney extracts they acquire a special predilection for the kidney when injected intravenously. Since the bacteria which have grown in a given tissue acquire greater affinity for this tissue, the likelihood of these bacteria to involve other structures is relatively slight; hence the secondary focus, a cholecystitis, for example, would appear to be less important as a distributer of bacteria than the primary focus; if, however, the secondary focus happens to be in a joint, of which there are many, it may play an important rôle in causing extension to uninvolved joints and in preventing recovery.

The bearing that these results have on the specific treatment of these diseases is evident. The injection of a streptococcus vaccine or antistreptococcus serum without regard to the tropic condition of the infecting strain or the one used in their preparation is, in the light of these results, far from an exact method of treatment. However, the occasional, seemingly good result observed by some may be due to the use of a serum or vaccine made from strains in the same tropic condition as the one infecting the individual so treated.

The results detailed in this and in previous papers seem to bring the necessary experimental proof that chronic foci of infection play a most important rôle in causing systemic disease, a fact which has been observed and frequently commented on by different observers, but has been recognized in its full clinical significance especially by Billings.[19] A focus, such as a pocket in the tonsil which cannot heal for mechanical reasons and which is constantly filled with pus and necrotic material, teeming with bacteria, must be regarded in the light of these findings as a culture tube with a permeable wall affording abundant opportunity for the entrance of bacteria and their products.

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INFLUENCE OF PEPTONE ON TOLERANCE OF THE BODY FOR HOMOGENOUS OVARIAN TRANSPLANTS*

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Much work has been done recently on the subject of the survival of foreign grafts, and interesting results have been obtained concerning the nature of the reaction by which the host destroys the engrafted tissue.

Tuffier[1] reports twenty-four attempts at homogenous grafts of ovarian tissue in man with failure in every case, the same technic being used by which uniformly successful results were obtained in autogenous grafts. He states that as a foreign body the graft is destroyed by macrocytes, and if the macrocytes could be prevented from attacking the graft, it might be possible to obtain success.

Castle and Phillips[2] conclude from experimental work on guinea-pigs and analysis of clinical results that homogenous transplantation of ovaries is not practical in domestic animals and man, unless the tolerance of the body to foreign tissue can be raised. Out of 141 guinea-pigs ingrafted with foreign ovaries, only three gave a functional result.

Davidson[3] reports success with autogenous transplants, but no permanent growth of homogenous grafts, and concludes, "It is a much more difficult thing to obtain permanent growth and function of homotransplants." Marshall and Jolly reached the same conclusions in working on animals.

Murphy has shown that the destruction of heterogenous tissue is brought about by the action of lymphoid tissue of the host,[4] and has had marked success in inhibiting the reaction against these foreign grafts[5] by the use of Roentgen rays and the injection of benzol (benzene, C_6H_6). (Repeated injections of benzol were quite harmful to the host.)

Leo Loeb[6] offers a very illuminating article on the behavior of tissues in a changed chemical environment. His conclusions are as follows: (*a*) In autogenous transplants, some of the tissue may live and grow, but in homogenous transplants only very rarely does this occur; and when it does, the metabolism of the graft becomes much altered in its new environment. (*b*) Different tissues may show different resistance to autotransplantation and homotransplantation, and different experiments may bring out variations of individual reaction between the tissue and the new host. (*c*) For the first week, there is little difference in the behavior of autotransplants and homotransplants; then a gradual destruction of the latter sets in, or the metabolic disturbance in the graft due to the shock of transfer may be great enough to prevent its ever recovering. (*d*) Destruction of the graft is brought about by a secondary reaction on the part of the host, and is accomplished by increased activity on the part of the connective tissue of the host. The action of the two factors is interdependent, but in a given case, one or the other predominates. (*e*) Function of corpus luteum is reduced after autotransplantation; in case of the latter, it is reduced by injurious action of the body fluids. Loeb further states that the toxic action of the body fluids of the host is not a factor in destruction of homografts. Ingebrigtsen,[7] in working with tissues in vitro, observed that normal autogenous serums offer better mediums for growth of tissue than similar serums which have been heated to a degree which causes destruction of complement (56 C. for 30 minutes), and that the reverse is true of foreign serums.

Carrel and Ingebrigtsen[8] found that the fluid of cultures in vitro containing a heterogenous serum has in five days acquired the power to hemolyze the red blood cells of the animal furnishing the heterogenous serum, while the serum of controls remains nonhemolytic. They attribute the development of hemolysis to the presence of antigen. This reaction of the graft is in turn met by the reaction on the part of the host, which we see manifested by a round-cell infiltration of the tissues of the graft, and which leads to the ultimate destruction of the graft.

Vaughan[9] also states that "any foreign protein (in this case ingrafted tissue) which can grow and multiply in the body of a given animal may prove pathogenic to the animal." He believes that some of the body cells in preparing for their combat with foreign protein develop a new function: that of elaborating a new and specific ferment which will digest and destroy the foreign protein.

In work done by Carrel[10] it was found that the limbs transplanted on an infected host were more apt to live than were those transplanted on an uninfected host. This would indicate that the action of the infecting bacteria had some inhibitory influence on the reaction of the host against the graft. Furthermore, since Besredka, Ströbel and Jupille[11] have shown that the action of complement on bacteria gives a substance which is identical in many of its physiologic actions to the substance obtained by the action of complement and peptone, it does not seem unreasonable to suppose that injections of Witte's peptone should have a similar effect on the reaction of the body against ingrafted tissues.

It was therefore thought that it might be profitable to undertake the following animal experiments in order to determine whether or not the repeated periodic injections of a solution of Witte's peptone would increase the tolerance of the body to grafts of foreign tissue.

TECHNIC

Operation.—The rabbits were operated on in pairs in order to make possible the immediate transfer of the grafts. The strictest aseptic technic was followed. A lower median incision was made through which both ovaries were completely removed. Great care was taken to leave no native ovarian tissue behind. The pedicle of the gland was clamped with

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7. Ingebrigtsen, Ragnvald: The Influence of Heat on Different Sera as Culture Media for Growing Tissue, Jour. Exper. Med., 1912, xv, 397.
8. Carrel, Alexis, and Ingebrigtsen, Ragnvald: Production of Antibodies by Tissues Living Outside of the Organism, THE JOURNAL A. M. A., Feb. 17, 1912, p. 477.
9. Vaughan: Protein Split Products in Relation to Immunity and Disease, Philadelphia, Lea & Febiger, 1913, pp. 22, 23.
10. Carrel, Alexis, quoted by Tuffier (Footnote 1).
11. Besredka, A.; Ströbel, H., and Jupille, F.: Anaphylatoxin, Peptotoxin, und Peptone in ihren Beziehungen zur Anaphylaxie, Ztschr. f. Immunitätsforsch., 1913, xvi, No. 3, p. 249.

Kelly forceps and ligated below the forceps, and then cut between the ligature and forceps. Multiple simple grafts were used. One ovary was discarded and the other sectioned for grafts into the other rabbit. The ovary which was used for grafts was held by the pedicle and was not touched by instruments or gloves. The method of cutting the grafts differed and will be detailed later in each case, but the cardinal points observed were:

1. To minimize the traumatic shock and the danger of infection to the ingrafted tissue, by having it come in contact with nothing except the sectioning instrument, and the use of a very sharp sectioning instrument.

2. To minimize the time which the graft was in contact with the air between removal from the donor and implantation into the host.

3. To obtain good contact between the cut surface of the graft and a portion of peritoneum where the possibility of vascularization was good.

The grafts were left free in order to avoid trauma incident to suturing them in place. The abdomen was closed in layers with linen.

Peptone Injections.—Peptone injections were made at the time of operation and thereafter every four days until the animal was sacrificed for necropsy. The injections were made intraperitoneally under aseptic precautions, and the dose used was approximately 1 c.c. of a boiled 10 per cent. solution of Witte's peptone to each 100 gm. of the rabbits' weight.

The rabbits used as controls underwent the same operative technic as experiments, but received no peptone injections.

Following the peptone injections, the animals showed a reaction which was manifested by labored breathing, restlessness, and general bodily weakness similar to that described[11] as following the injection of an attenuated dose of peptotoxin which had been formed by the reaction of complement and peptone outside of the body. In every case after the animals had received from three to four injections, they showed a condition of reduced metabolism evidenced by a loss of body weight and marked thinning of the coat. This was not noticed in the controls, which were otherwise subject to similar conditions.

Ten rabbits were operated on; five were used for peptone injection and five for controls. The experimental rabbits and their controls in each case were operated on in pairs and subjected to similar conditions. The controls of Experiments 1 and 4 were lost through postoperative death.

SUMMARY OF EXPERIMENTS

EXPERIMENT 1.—Rabbit 1 (nineteen days' duration). Large en masse graft, consisting of one-half ovary, on mesentery of large bowel. At necropsy the graft had a large area of central necrosis surrounded by ovarian tissue which showed signs of beginning destruction. All of the ovarian tissue remaining was invaded by a new blood supply. The invasion by round cells had already taken place. This experiment was not controlled.

EXPERIMENT 2.—Rabbit 2 (controlled by Rabbit 3; six weeks' duration). Multiple small graft on mesentery. Grossly, the grafts in the animal injected with peptone had acquired a more profuse blood supply than those in the control in which no peptone had been injected, and were larger and felt more firm. On microscopic section it was found that destruction of ovarian tissue was complete in them, while there were small areas of ovarian tissue remaining in the grafts of the control. The invasion by round cells and connective tissue was more marked in the rabbit receiving peptone injections.

EXPERIMENT 3.—Rabbit 4 (controlled by Rabbit 5; eight weeks' duration). Multiple millet seed grafts in peritoneal cavity. These grafts were firm and healthy in appearance, and had a much more profuse blood supply than their controls; but microscopic sections showed all of their ovarian tissue to be necrotic, while there was still some ovarian tissue remaining in the controls. The cellular infiltration was more marked in the grafts of the injected animal.

EXPERIMENT 4.—Rabbit 6. Single en masse graft on broad ligament. Twelve weeks' duration. Twenty peptone injections. The graft had undergone complete destruction and had been almost entirely absorbed.

EXPERIMENT 5.—Rabbits 7 and 8; of only a few days' duration. Interrupted by the incidence of peritonitis, and the grafts had evidently lost their viability owing to the peritonitis, rather than to the usual reaction of the body against foreign tissue.

COMMENT

As has been seen, there are many references in the literature to the nature of the mechanism of the reaction by which homografts are destroyed. Tuffier explains the process by the action of macrocytes. Loeb believes that such grafts are destroyed by mononuclear invasion and proliferation of connective tissue. Murphy has shown that the presence of lymphoid tissue is essential before the host can destroy a foreign graft. In the foregoing experiments, the grafts were not attacked by macrocytes. Mononuclear infiltration and connective tissue proliferation were uniformly present. I can see no reason, however, to suppose that these evidences of reaction on the part of the host are the essential factors in the destruction of the graft. I am rather inclined to take exception to the further statement of Loeb that the toxic action of the body fluid of the host is not a factor in the destruction of these grafts. Several of the observations quoted above would indicate that the serum plays the primary rôle in the destruction of homografts.

1. Ingebrigtsen found that if complement was exhausted from foreign serum, it offered a better culture medium for tissues than normal serum, and that the reverse was true for autogenous serum.

2. There is no evidence of reaction against foreign tissues until just that period of time has elapsed after their introduction into the body which is necessary for the development of specific immune bodies. This led to the hypothesis that the tissue cells might be destroyed by a lytic action of the serum involving Erlich's side chain of the third order. The round-cell infiltration and connective tissue invasion, which was observed in all instances, may be explained as the usual reaction against any tissue in the body which becomes necrotic.

It was on the basis of this theory and the observation of Carrel that bacterial infection inhibited the reaction of the host against homografts that the foregoing experiments were undertaken, because Besredka, Ströbel and Jupille have shown that peptone exhausts complement from the serum and has a similar action to bacterial intoxication.

CONCLUSIONS

As the result of the experiments, we may reach the following conclusions:

1. Peptone injections, as they were made, tend to intensify rather than inhibit the reaction of the host against homogenous grafts of ovarian tissue.

2. Such injections of peptone produce a condition of reduced metabolism in the animal, but not to such an extent as to prove dangerous to life.

3. An abundant blood supply to the graft does not indicate that it is viable in its new environment, but may rather be evidence of an intense reaction against it on the part of the host.

4. The destruction of the graft is practically complete by the sixth week, both in animals injected with peptone and in those not injected.

5. The host primarily reacts to the presence of the graft by revascularization of its tissues, and the further reaction which evidently involves the destruction of the graft is evidenced by round-cell infiltration and proliferation of the connective tissue of the host.

6. The presence of peritonitis within a few days destroys the viability of intraperitoneal grafts.

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DETACHMENT OF THE RETINA

WITH A PRELIMINARY REPORT ON A NEW OPERATIVE PROCEDURE *

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Detachment of the retina is a condition of such seriousness, and its treatment is so unsatisfactory, that we feel justified in placing on record even a small number of cases.

There are three principal theories as to the causation of retinal detachment:

1. Von Graefe in 1854 assumed that a hemorrhage occurred behind the retina, basing his conclusion on the sudden appearance of the condition. Arlt considered that the fluid behind the retina was due to a secretion or exudation from the choroid pressing against the vitreous humor and thus bringing about its gradual absorption. The present theory, which has a large following, assumes a primary retroretinal exudation with compensatory diminution of volume in the vitreous.

2. Leber's theory, which embodies Müller's theory of fibrinous degeneration of the vitreous, and Iwanof's theory of detachment of the vitreous and shrinking, and Arlt's theory of rupture, or tear. Leber argued that given the shrunken fibrillary vitreous attached more extensively and firmly than normal to the retina, with its pool of fluid representing the amount of shrinking, the train is laid for an acute spontaneous detachment. A sudden rent occurs and through this the preretinal fluid rapidly becomes retroretinal and the detachment is accomplished.

3. Raehlmann's theory, which assumes a primordial alteration in the constitution of the vitreous, whereby, through the influence of osmosis, the watery constituents pass through the retina seeking to equalize with the juices of the choroid, which are rich in albumin.

Each of these theories has had its followers, but so far histologic examination has done little to establish any one of them. Our present point of view must rest on deduction and inference from well-known clinical phenomena. Speaking of retroretinal exudation, Schöbl[1] says:

> It is inconceivable that so large an exudation can be thus formed in a few moments, and even if this were possible and this exudation can overcome the normal pressure of the vitreous humor and press the retina inward, the intra-ocular tension must needs be enormously increased, and that is the condition that is hardly ever found in retinal detachment.

This point seems not to be well taken. Exudation from the choroid probably can occur rapidly. Intraocular tension depends not so much on excessive secretion as on the blocking of the outflow, so that even if we assume a choroidal exudation, increase in tension would not necessarily follow. Iwanof found in highly myopic eyes a detachment of the vitreous humor at the posterior pole, and his explanation of this fact was that the vitreous could not increase in volume as rapidly as the posterior part of the sclerotic was distended, and in consequence serum would have to fill the gap. If this were the active factor in myopic detachment, the lesion would invariably take place at the posterior pole, which is not the case. Also evidence goes to show that it is possible for the vitreous to increase rapidly in volume through imbibition of serum. This occurs in the rapid increase of tension during trephine operations in old glaucomatous eyes. Even if the anterior chamber is open, the pressure rises, and a prolapsed iris cannot be replaced. Also, after a loss of vitreous during cataract extraction, it is well known that almost all cases which heal up do not show detachment of the retina for some weeks, or even months. Such cases are invariably found with the eye plumped up to normal dimensions as soon as the wound is closed, generally on the following day. Iwanof thinks that the exudation behind the vitreous humor finally lacks room and must filter into the humor itself or pass backward through the retina and thus lift this membrane from the choroid. However, as Schöbl remarks:

> This explanation is incorrect and against all physical laws, since the fluid between the vitreous humor and the retina must exert an equal pressure in all directions and, therefore, could press the retina more firmly against the choroid, but could never detach it from this membrane.

A great deal of stress has been laid on rents in the retina, and it must be admitted that given a retinal rent it is conceivable that serous fluid might in such a case find its way through the rent between the retina and choroid. Many cases of detachment, however, show no demonstrable rents in the retina, and when one considers how much traction the retina can bear in old inflammatory conditions without showing any rent, it seems much too fantastic to assume the existence of a rent from traction when the most careful examination with the ophthalmoscope will not show any evidence of traction in the vitreous. In fact, most idiopathetic detachments have a sacculated, or rounded, appearance, which is suggestive of pressure from beneath, but has not the faintest resemblance to a condition which might be produced by traction bands in the vitreous. The commonest form of traction is that which occurs in the ciliary region from old inflammatory exudates, and while traction from exudates may occur, it is certainly very doubtful if it is in any sense a factor in the ordinary idiopathic detachment. The status of the so-called retinal rents has not as yet been

* Read before the Section on Ophthalmology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

1. Schöbl: Norris and Oliver's System, iii, 534.

satisfactorily established. A few have been observed in the periphery of the retina, but the causal relationship between rent and detachment is by no means settled. In one of our cases a well-defined "V"-shaped rent could be seen, across which ran a retinal vessel. As the direction of the retinal rent, which was roughly in the shape of a very obtuse angle, extended at right angles to the direction of greatest tension in the detachment, it seems more reasonable to assume that the rent was due to the pressure of the fluid from beneath and that it was a secondary feature.

The clinical course of many detachments is about as follows: The detachment occurs rather rapidly, and on our first ophthalmoscopic examination we find a perfectly clear vitreous with a sacculated spot in the retina and a vision which is reduced entirely out of all proportion to the local condition. One would think that a detachment which did not involve the macula and did not hang in front of it in the vitreous, would not reduce the vision. The vision is frequently very much reduced, however, and may become progressively worse in the early stages of the condition, so that the lymphatic derangement is far more serious than the local appearance would lead us to believe. In the detachment which occurs alongside of a sarcoma of the choroid, and which is manifestly due to the transudation of serum, the appearance and clinical characteristics are exactly the same as in the ordinary detachment, and these cases must be looked on as a still further proof of the distention theory. After detachment has existed for a certain length of time, floating bodies appear in the vitreous, and iritis and other inflammatory changes supervene. Traction bands may then form from degeneration of the vitreous. The diffusion theory "presumes differences in tension in two fluids, one of which is in front and the other behind an animal membrane. These conditions exist when the retina is detached. Behind the retina there is a relatively albuminous fluid, while in front of it in the vitreous chamber there is a fluid that contains but little albumin, the diffusion taking place more rapidly the greater the difference in density of the two fluids" (Schöbl).

Parsons[2] says:

> In most cases, according to some investigators in all, the retina is ruptured and fluid passes through the rent from the vitreous. It is certain that in many cases no rupture of the retina can be seen ophthalmoscopically, and it is probable that it is not an indispensable factor. If so, the fluid must be derived from the choroid or from the vitreous by a process of osmosis. Such experiments as have been made on the latter possibility have not been conclusive.

Vail[3] has recently written a comprehensive paper on the subject of treatment of retinal detachment which bears quotation in this connection. This paper is based on replies received from 281 oculists, 250 representing, according to the author's estimate, an average of twenty years of practice, and an experience averaging five cases a year, or about 25,000 cases in all, with the employment of every known line of treatment, "and not a single case of permanent cure in the lot." On the other hand, 31 oculists have secured cures; 25 each had a single cure; 4 secured 2 cures, and 2, 4 cures, making in all 41 patients reported cured. Two of these patients had detachment due to albuminuria in pregnancy, and they were cured after abortion. They should not be counted, as treatment is not applicable except in these unusual circumstances. This leaves 39 cures. In about one-half of this number the cure is not convincing from the records submitted, leaving, say, 20 cases, or less than 1 cure in every 1,000 cases. The author considers that these figures show conclusively that there is no proper treatment for this condition.

De Schweinitz, in a personal letter, says:

> The treatment that I have found most satisfactory has been posterior sclerotomy, with drainage of the subretinal space; rest in bed; and the injections subconjunctivally of saline solutions. In recent years I have added to this dionin, sometimes sweats, usually with pilocarpin.

Vail's theory is that there is a paralysis of the secretory function of the ciliary processes. This means that the secretion of aqueous is suddenly arrested. There being nothing wrong with drainage channels within the eye, the watery elements find ready egress, thus giving a minus tension. Leber found 90 per cent. had minus tension. The withdrawal of normal tension causes passive hyperemia of the blood vessels of the tunica vasculosa. This allows diapedesis and transudation. The vitreous contracts because it loses its percolating supply of aqueous, which soon drains off through the efferent channels which are wide open, and the fibers of the vitreous naturally contract like a sponge would after losing its water. The subretinal transudation is highly albuminous. The watery elements ooze away and are replaced by fresh serum, a poor substitute for aqueous. The tissue colloids and circulating colloids imbibe all the moisture they can. The reaction of the transuded juices becomes altered to a less than normal alkaline or an actually acid state. Vail further says that the causes of such a paralysis of the secretion of the ciliary body may be acute local and systemic, or chronic local. Acute local cases are from blows; certain drugs, like belladonna, when the patient has idiosyncrasy or a preceding equatorial choroiditis, or myopia. Acute systemic cases might arise from certain toxemias, like those of albuminuria, diabetes, etc., which have a paralyzing effect on the secretory function of the ciliary body. "Chronic local" from slowly progressive atrophy of the secreting epithelium of the ciliary processes. Vail's conclusions are that surgical treatment is not founded on scientific principles; that detachment of the retina is not a disease, but a symptom; that the disease is paralysis of functions of the ciliary processes, causing an arrest of aqueous secretion within the eye. The treatment should be the use of those measures, and only those, which have for their objects the reestablishment of the lost function of the ciliary processes. Vail rather advocates subconjunctival injections of sodium citrate, after M. H. Fischer's ideas.[4] This treatment is supposed to reestablish the aqueous flow by rendering alkaline the intra-ocular juices.

While this theory has a very attractive sound, it must be remembered that it is for the most part nothing more than a theory, and while it fits certain clinical aspects of the cases, so far as treatment is concerned, little benefit apparently has been secured. Sodium citrate injections, or any form of subconjunctival injections have given not the faintest glimmer of hope in our hands. We are, however, prepared to subscribe to the theory that the transudation of serum beneath the retina is but a symptom of a deeper intra-ocular

2. Parsons: Pathology of the Eye, iv, 1166.
3. Vail: An Inquiry into Results of the Established Treatment of Detachment of the Retina, and a New Theory, Ann. Ophth., 1913, xxii, 1.
4. Fischer, M. H.: Glaucoma, Tr. Am. Acad. Ophth. and Otolaryngol., 1911.

disorder, but cannot altogether feel that it is a progressive degeneration. There is reason to believe that the actual detachment has something to do with lowering the nutrition of the eye and subjecting it to the well-known degenerative processes which supervene in a large proportion of cases—floating opacities of the vitreous, iritis and cyclitis, and later cataract. All these come on after the detachment has existed for some time, and are, as a rule, the more prone to occur the larger the detachment. The clinical course of the ordinary idiopathic detachment does not suggest a progressive degenerative process. If such were the case, there would be no reason why a detachment should not appear gradually and gradually enlarge. On the other hand, the detachment appears suddenly and, as a rule, remains approximately the same size until further degenerative symptoms set in. It seems, therefore, as if the exudate came from a sudden attack which subsides, leaving the exudate in situ, and that further degenerative processes are due to the presence of the detachment.

We wish to record our belief that the clinical evidence is in favor of the choroid as an origin for the subretinal fluid. It may be asked that if the choroidal fluid filters into the subretinal space, why should it not also filter into the suprachoroidal space, and that is exactly what it does. As long ago as 1830, William Mackenzie in his treatise on Diseases of the Eye, said: "It has been ascertained by dissection that a watery fluid is sometimes present between the sclerotica and the choroid." This fact appears somewhat to have been lost sight of by later writers, as is perhaps natural, considering the fact that the condition cannot be discovered with the ophthalmoscope, and the ordinary puncture operations have simply allowed the fluid to escape without giving any light as to the true situation of the fluid. In trephining the sclera, it is in many instances found that a gush of fluid escapes before the choroid is punctured. The histologic examination of enucleated eyes for simple detachment of the retina is naturally rare. It will usually, however, be found that in the process of hardening, the anatomy of the detachment as observed during life is entirely obliterated. This is especially apt to occur in recent detachments before shrinkage and degeneration of the retina have occurred, and it is just in these cases in which such an examination would be of most value. We have not been able to find, in the limited number of cases examined, any definite adhesions, and definite localizations of the detachment by adhesion between the retina and choroid, nor any suggestions as to the origin or amount of the fluid.

Kuemmel[5] gives a very interesting account of the histologic examination of an enucleated eye with retinal detachment. He deduces some interesting theories, which to a certain extent harmonize with Vail's ideas, but the patient presented at the time of the enucleation a sharp atack of secondary glaucoma. Moreover, the fact that the process was an old one to a certain extent introduces elements which must be taken into consideration. He found inflammatory changes of a proliferating character in the iris, ciliary body, and choroid, and considers that these various changes are at the bottom of the choroidal effusion which leads to detachment. He further says:

> On account of these changes in the choroid and the ciliary body, disturbances must arise in the vitreous body, which, although it cannot be shown that they lead to disturbance of the fibrillae in an atrophic sense, still cause abnormal connections of this body with the surface of the retina, as is shown in the specimen. This is especially conspicuous in the anterior portion. On account of these unequal connections at the juncture of these two structures, there must arise differences in the tension, which must remain latent as long as the retina is connected.

He further argues that given a diminution of tension of the vitreous there must be a heightened tension in the choroid, which is made apparent by the increased blood supply. (If this principle were true, detachment of the retina should follow more frequently attacks of choroiditis, especially when accompanied by diminished tension.) Thus, a decrease of tension arises from the direction of the choroid to the vitreous body. He further says:

> We may accordingly assume that the retinal detachment arises by virtue of pressure from behind, due to the retroretinal transudate, as well as by traction on the part of the vitreous body from the opposite side.

Taking all of this into consideration, it seems to us that in the present state of our knowledge, we are not justified in assuming anything more than that retinal detachment occurs as the result of a lymphatic derangement leading to exudation from the choroidal vessels. It has been argued that in the cases of detachment following a blow, the degenerative condition predisposing to the detachment were already existent. This may be perfectly true, but, on the other hand, the manner in which traumatic detachment forms seems directly to support the theory of a choroidal effusion and directly to controvert the theory of vitreous traction. Traumatic detachments show at least that detachment can occur without participation of the vitreous body. It seems somewhat unreasonable to presuppose choroidal disease in traumatic detachments, for, if such were the case, we should have evidences of choroidal disease followed by later detachments in the fellow eye, which clinically do not occur. Cases of traumatic detachment have been observed for years, in which no detachment occurred in the fellow eye. This would not be the case if a degenerative uveal process were at the bottom of the detachment, for it is hardly conceivable that such a process as has been supposed to exist could occur in one eye alone. The clinical course of traumatic detachments also tends to support the idea that the secondary degenerations are due to the presence of the detachment. For secondary degenerations, uveitis, cataract, etc., occur in traumatic detachments just as they do in the idiopathic detachments. In myopia the question is a much more complicated one. It cannot be denied that the structure of the retina makes it less extensible on account of its rich connective tissue supporting the framework. And yet, as Schöbl has pointed out, if detachment was due solely to the lack of extensibility of the retina, it would occur invariably at the posterior pole. It seems probable, therefore, that the elongation of the myopic eye is merely a predisposing factor and that the exudation from the choroid takes place in these cases in somewhat the same manner as in the idiopathic and traumatic ones. It must, of course, be clearly understood that the class of cases in which disease of the choroid, or ciliary body, or both, lead to floating opacities in the vitreous, diminished tension, etc., that the detachment is apt to occur as a degenerative symptom from the general lymphatic disturbance, from the pulling of old organized exudates, etc.

5. Kuemmel: Ann. Ophth., 1913, xxii, 437.

These cases, while bearing certain points of similarity, are clearly to be placed in an entirely different category from the ordinary idiopathic detachment. In other words, a clear distinction should be made between the cases in which the inflammatory symptoms antedate the detachment and those in which the detachment antedates the inflammatory symptoms.

It seems to us that we are justified in the two following assumptions: First, the presence of the detachment in itself leads to lymphatic disturbances and further complications of a degenerative nature. Second, the evidence on all sides, so far as it goes, is in favor of some operative procedure which withdraws the subretinal and suprachoroidal fluid. In the past when simple sclerotomy has been done and the fluid evacuated, it has been the rule to find a marked improvement in an attempt, however feeble, at reattachment. To be sure, when patients are allowed to get out of bed, the retina promptly redetaches, but this may be due to other factors. It seems probable to us that the fluid has not, in these cases, been removed completely enough to allow the retina to assume its normal position. The vision usually has improved, however, and the conditions have been promising for a time, and this has not been the case with any other means of treatment in our hands. With pilocarpin sweats, and rest in bed—in other words, a drastic elimination treatment—the fluid has at times undergone partial resorption, but this has never in our experience led to more than temporary relief, and has the serious objection of being greatly depressant, so that it has been abandoned by us, as by most surgeons within our knowledge. Good results have been reported by various surgical measures from time to time, but in all of these, puncture of the sclera occupies an important place, and he would indeed be venturesome who asserted that the scleral puncture was not the main, or perhaps the only cause of the improvement secured. Casey Wood[6] says:

> Scleral puncture seems to have held its own to the present time, and alone, or in conjunction with other forms of treatment, is practiced more frequently in detached retina than most of the surgical procedures about to be mentioned. Cures following its performance are not uncommon and when practiced within proper scleral areas, it is practically devoid of danger.

He also says (page 1356):

> Quite a number of brilliant and permanent cures have followed persistent treatment and a repetition of operations, in spite of these relapses. . . . No surgical intervention should be undertaken unless all parties to it are willing to have the patient submit to repeated operations as long as there is a chance of recovery. Deutschmann, for example, has finally succeeded in several cases of relapse, after operating a dozen times or more.

Acting on the foregoing ideas, we have endeavored to secure permanent drainage by means of a trephine opening in the sclera, through which the subretinal fluid could be completely removed by aspiration with a small syringe. This aspiration could be repeated several times, if necessary.

Trephining for detachment has also been done by Walter R. Parker,[7] and probably by others, with good results; but the incision of the choroid heretofore practiced seems likely to lead to reaction and vitreous hemorrhage, so that aspiration has been substituted.

6. Wood, Casey: Ophthalmic Operations, Chicago, Cleveland Press, 1911, ii, 1,360.
7. Parker, Walter R.: Tr. Am. Ophth. Soc., 1914, p. 661.

It is a well known fact that the subretinal fluid in detachment tends to gravitate to the lower part of the globe. There are several points of doubt in connection with this phase of the subject, but it is probable that detachment is not a purely local process and that where several detachments occur, their shape is determined by more or less imperfect adhesions between the retina and choroid, and that the entire area beneath the retina is to a certain extent in communication. Frequently a detachment in the upper part of the field will subside, leaving the retina over the site of the old detachment apparently reattached, and the fluid will gravitate to the most dependent position—the lower part of the eyeball. It seems wiser, therefore, to select for the site of operation the most dependent position possible, which is within the area of the detachment, and this will usually be a point about equidistant from the external and the inferior recti muscles, or a corresponding point between the internal and the inferior recti. The trephine opening should be made as far back as possible, and this is naturally more easily accomplished when the operation can be done between the external and inferior recti muscles than on the opposite side. No speculum is necessary. An assistant inserts a strabismus hook and retracts the lower lid and tissues of the external canthus. A curved incision is made through the conjunctiva with the convexity in the direction of the cornea, and the tissues are taken up down to the sclera. It is wiser at this juncture to put in a single silk suture at the summit of the flap, as otherwise the capsular tissue underneath the flap is apt to be rolled up and the ultimate flap will then be composed of nothing but conjunctiva, leaving more or less thickening and adhesions in the episcleral tissues, which tends to seal up the trephine opening. The entire thickness of tissue is taken up, down as far as the sclera, and dissected well back. The assistant then holds this flap back by means of the suture. The trephine opening is then made with a 2 or 3 mm. trephine. We are of the opinion that a larger opening is better, but experience is necessary to decide this point. On the removal of the trephine button, there is in many instances a gush of serous fluid from the suprachoroidal space. Examination of the eye usually shows considerable subsidence of the detachment after this fluid has escaped. The flap is then sutured into place and the eye bandaged and the patient put to bed. It goes without saying that the pupil should always be well dilated with atropin before the operation, both for purposes of examining and to keep the eye as free as possible from the tendency to inflammation. There is usually very slight reaction after the trephine operation. In a week or ten days later, the patient is put on the operating table and the needle of a small aspirating syringe is inserted into the subretinal space through the conjunctiva and choroid. The subretinal fluid is then forcibly aspirated, after which the patient is put to bed for a day or two, as circumstances require. The aspiration operation is followed by practically no reaction and can be repeated as long as the trephine opening remains free. In this connection, it is very important to have the flap properly made, as, if capsular tags are allowed to roll up under the flap, it is difficult to see where the opening lies and to enter the needle requires a great deal of stabbing around in the dark. If the conjunctival flap heals properly, the trephine opening shows as a small dark spot, which is easily identified. It does not show, however, so plainly as a

trephine opening at the corneal margin, on account of the greater thickness of the conjunctival and capsular tissues in the flap. In some of the cases presented, a single aspiration was sufficient, but in others there was reaccumulation of fluid and the aspiration had to be repeated.

It is evident that this procedure, in order to be successful, must be undertaken before the detachment is old enough to have undergone degenerative changes. A shrunken and contracted retina will, of course, not fall back into position, even if the fluid be withdrawn; nor is there any probability of success if inflammatory changes have set in, especially if the intra-ocular tension has fallen much below the normal. It is, also, hardly conceivable that the operation would be successful in high degrees of myopia, although on this point experience is lacking. The rationale of the operation, however, is in recent traumatic or spontaneous detachments where there seems a likelihood that the fluid accumulation is acting to keep up the condition.

REPORT OF CASES

Case 1.[8]—B., a bookkeeper, aged 21. Family history negative. Sept. 22, 1914, he noticed blurring in the sight of the left eye. September 26 he visited a hospital but did not receive any treatment. He visited Dr. Curtin, October 1. There was no history of trauma. Urinalysis, Wassermann and von Pirquet all negative. Blood pressure 128. R. V., 20/40. L. V., hand movements in the lower and outer parts of the field. There was low myopia in each eye. A large detachment of the lower and outer part of the retina was found in the left eye. The retina was bluish-white and thrown into folds with loss of the light reflex of the vessels. The disk was still visible, but the detachment extended nearly to the macular region. There were a few floating vitreous opacities. He entered the Manhattan Eye, Ear and Throat Hospital, October 2, and was put to bed, pupil dilated with atropin and pressure bandage applied. Pilocarpin sweats were given every second day. October 12, no improvement being apparent, he was operated on by Dr. Curtin. Under cocain, a button of sclera, 2 mm. in diameter, was removed by the trephine from under a conjunctiva flap over the site of the detachment and as far back as possible between the inferior and external recti muscles. The choroid and retina were not punctured. The conjunctival flap was united by two silk sutures and a moderate pressure bandage applied. He continued in bed until October 22, having had but a moderate amount of reaction. On that date, a medium-sized aspirating syringe was pushed through the conjunctiva and scleral opening and choroid, and 25 minims of serous fluid withdrawn. This subsequently was found to resemble serous fluids in general. The fundus of the eye was immediately examined and the retina was seen to have fallen back into place. The patient was returned to bed and kept there until November 4. The vision on the following day was found to be "fingers at 8 feet." There was hardly any reaction, and the eye did not even redden. The vision gradually increased. He was allowed to get out of bed November 4. November 16 his vision and retraction were as follows: Right, 20/40: 20/20 with a minus 1.50 cyl. axis 180 degrees; left, 20/70 + : 20/40 with a minus 1.00 cyl. axis 180 degrees.

December 22, vision in the left eye was 20/30. January 27, the left lens was increased to — 1.50 cyl., which gave him vision of 20/20. At the time of writing (March 15, 1915) his vision has remained 20/20 with his correction. Externally the eye is normal in appearance, except that at the lower and outer aspect of the globe can be seen a small bluish circle, the site of the trephine opening. The conjunctiva is slightly chemotic over this area.

Ophthalmoscopically, the retina is entirely attached except in a small area in the lower and outer field, which is probably at the site of the scleral trephining. This can only be seen with the pupil dilated and the patient looking markedly downward. Small white striae can be seen in the retina in the lower macular region and lower parts of the fundus, the former site of the detachment.

There are a few floating opacities in the vitreous that can still be seen. The patient no longer observes flashes of light or disturbances in the eyes or contour of objects and readily reads the test type, in contradistinction to his earlier tests when he would deliberate and study the letters for a short time before pronouncing them.

As his record shows, his vision has gradually increased so that today it is slightly better than normal.

The patient has changed his occupation to that of salesman. He returned to work Nov. 23, 1914, and travels around the city on the various surface, subway and elevated trains, and has taken no special precautions regarding jarring, and his eye, to date, shows no indication of any redetachment.

Case 2.—J. W., a clerk, aged 23. Family history good. He smokes and drinks moderately. Three years ago he had pneumonia. Nov. 13, 1914, he was accidently struck in the right eye by a companion. Immediately following it pained for about one-half hour. Two weeks later he noticed when going out into strong sunlight a black spot appeared before his vision. He tested the eye and noticed that day by day the vision was failing, so that by December 8, he could see very little. On this date he came to the hospital. Vision in the left eye was 20/20. In the right eye "fingers at 1 foot" in the upper field. Examination showed a large detachment in the upper and outer part of the fundus, with general edema of the entire retina, and with some slight detachment apparent below the macula. Three diameters to the nasal side of the disk, there was a patch of dark pigment, and through the center of this a whitish mass projected forward into the vitreous. Above this at the outer side could be seen grayish-white striae extending upward and inward, and down from this mass, which looked like a rather atypical form of retinitis proliferans, the retina was bluish-white and detached. The patient entered the hospital on December 12 and a scleral trephine was done by Dr. Thomson, between the inferior and external recti. December 22, the subretinal fluid was aspirated. At first there was no change in the vision, but after the aspiration the vision had increased to 20/200, and the field was enlarged. Twenty minims of fluid had been withdrawn. This was found to have the usual characteristics of serous fluids. He was kept in bed for a week, at which time the vision equalled 20/70 in a field extending to 50 degrees laterally on each side, 30 degrees above and 70 below. At present the retina is entirely reattached in the upper field. There is still a detachment below the mass. The vitreous is slightly hazy. The mass is apparently unchanged, except that at the apex can be seen a few small vessels, and several dark striae run to the posterior surface of the lens. Externally the eye appears normal. The pupil reacts to light, and the trephine opening can be seen through a slightly chemotic conjunctiva. Urinalysis, Wassermann and von Pirquet negative.

Case 3.—J. Z., a baker, aged 42. About the middle of October he noticed the sight of the right eye was becoming dim. He did nothing until December 16, when the vision was so badly reduced that he could not count fingers. December 23 he came to the hospital. There were two large detachments occupying the entire lower half of the right fundus. The disk was partly obscured. The form field could not be made out, and the light field was obscure in the larger portion. The patient gave a history of chronic rheumatism, although his health had been good for the past two years. The tension was reduced in the right eye. Vision of the left eye was 20/20—. Urinalysis, von Pirquet and Wassermann negative. The patient was put to bed with atropin and a pressure bandage. On January 5, Dr. Curtin did a trephine operation, making a 2 mm. opening between the external and inferior recti muscles. Very little fluid escaped when the trephine button was removed, so the needle of the aspirating syringe was entered through the choroid, and 20 minims of serous fluid was withdrawn. The following day the patient

8. The following case was reported in the Ophthalmic Record, February, 1915.

could count "fingers at 3 feet." His vision increased so that at the end of a week it was 20/200, and the field contracted only in the upper half. He was kept in bed a week, but after he got up the detachment increased and vision failed gradually to "fingers at 4 feet." January 16, 15 minims of fluid were again aspirated, without, however, securing a reattachment of the retina. February 4, 15 minims more of fluid were aspirated. Following this aspiration, the reaction was more severe and he was put to bed and iced cloths applied to the eye. A week later the ophthalmoscope showed that a hemorrhage into the vitreous had occurred and vision was reduced to hand movements. At present the eye is white. The trephine opening can be seen as a small bluish spot. The tension is normal. The vitreous is so clouded that details of the fundus cannot be seen. The field for light perception is good.

Besides these cases, about ten similar operations were done in old cases of detachment, most of which had lasted a year or more. It has not been thought worth while to report these cases in detail, nor was it to be expected that any marked success would be attained. However, a certain number of facts of interest have been determined.

The reaction seems entirely confined to the trephine operation and is very slight. The aspiration seems to cause no perceptible reaction, even when repeated at fairly frequent intervals, unless, as in one of the cases reported, a hemorrhage occurs following its performance. This accident seems rather unlikely to occur, however, and has not been noted in any other case.

The amount of fluid withdrawn seems to have very little influence on the amount of the reaction. In one case, 40 minims were withdrawn, and the following day the eye was hardly even flushed.

We have come to no very definite conclusion as to whether it is better to aspirate immediately or when the reaction has subsided. Where suprachoroidal fluid exists in any amount, which has been in more than half of the cases, it is perhaps as well to postpone the aspiration, but if when the trephine button has been removed no fluid comes away, showing that the entire amount is beneath the retina, it is probably as well to aspirate then and there. This course does not greatly increase the external redness of the eye, but it cannot be doubted that the lymphatic disturbance is greater when trephining and aspiration are done at the same sitting, and this point should, of course, receive due consideration.

In several of the cases, especially when the flap was not carefully dissected up in its entirety—that is to say, so as to include the conjunctiva and capsule of Tenon in one flap—the trephine opening was later found partially occluded and it was difficult to introduce the aspirating needle. In most cases, however, the opening can usually be found and the introduction of the needle is attended with but little difficulty. In conclusion, it must be emphasized that this procedure gives promise of results only in recent cases, when the light perception in the retina is still retained; when no inflammatory products are thrown out into the vitreous; when the tension is not materially reduced; and when a high degree of myopia does not exist.

A Favorable Death Rate.—Neither the state nor any of its municipalities should regard its death rate as favorable when about 50 per cent. of the deaths, according to present-day knowledge are preventable.—Rep. Pub. Health Com. Minnesota Pub. Health Assn.

SCLEROTREPHINE OPERATION FOR DETACHED RETINA

CLINICAL REPORT OF ELEVEN CASES *

WALTER R. PARKER, B.S., M.D.
DETROIT

After observing the results obtained by Colonel Elliot in treating glaucoma by his corneoscleral trephining operation, it seemed possible that scleral trephining might be utilized in the treatment of detachment of the retina.

May 19, 1913, the first operation was performed, and since that time fifteen operations have been made on eleven patients, all of which are included in this report.

Two operations were performed in Case 7, also in Case 8, and three in Case 9. In Cases 1 and 2, the sclera was trephined over the site of the detachment without incising the choroid and retina. In all the other cases, in addition to trephining the sclera, an incision with a cataract knife was made in the choroid or the choroid and retina, and the subretinal fluid, and, in most instances, a few drops of vitreous, were allowed to escape.

TECHNIC

The operation may be described in detail as follows: The conjunctiva and the underlying tissues are grasped with a pair of forceps at a point corresponding as nearly as possible to the lowest portion of the detached retina, and by a single cut with a pair of scissors, a triangular incision is made down to the sclera. Before losing the grip with the forceps a suture is passed through the apex of the triangular flap. This procedure not only enables the operator to include in the suture all the tissue incised, but affords a ready means of retraction. The suture can be held by an assistant, or a pair of artery forceps can be applied and so placed that the proper pull will be exerted to give a good view of the field of operation. After the sclera has been bared, a 2 mm. trephine opening is made, and the choroid, or choroid and retina incised in such a manner as to avoid injuring the large vessels. The free escape of the subretinal fluid may be followed by a few drops of vitreous. The needle on the suture previously passed through the apex of the flap is now passed through the subconjunctival tissues and the conjunctiva and the wound closed. A single suture on each side completes the operation. The after-treatment consists of rest in bed for ten days in such a position as to favor the replacement of the retina.

The cases are all from my service in the ophthalmic clinic of the University of Michigan, and are in no way selected.

A brief outline of the history of each case is as follows:

REPORT OF CASES

CASE 1.—*History.*—The patient, N. N., female, aged 50, presented herself for examination in the ophthalmic clinic of the University of Michigan, May 12, 1913, complaining of failing vision for a year, and almost blindness for eight months.

Family history negative. Personal history, uterine prolapse and poor general health.

Examination.—Vision, right eye, 5/30; left eye, l. p., with poor projection. Tension normal in both eyes. Pupillary reflexes active to direct in right eye, and to consensual in left eye; feeble to direct in left eye and to consensual in

* Read before the Section on Ophthalmology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

* On account of lack of space this paper has been abbreviated for THE JOURNAL. It will appear in full in the Transactions of the Section and in the author's reprints.

right. Accommodative reflexes normal in both eyes. Transillumination negative.

Ophthalmoscopic Examination.—Right eye: Beginning nuclear cataract; otherwise no gross lesion. Left eye: Media clear, retina detached from opposite 2, around below and up to 10, upper border of detachment being on line of junction of upper and middle third of disk. Detached portion of retina fluctuates, and the vessels can be easily traced over it.

Visual Field (Fig. 1): Candle field, taken at distance of 1 meter.

Treatment.—May 19, 1913, trephine operation for detachment of retina performed. Stephenson's trephine used; 2 mm. disk removed. Choroid not incised. Almost no reaction followed. On the eighth day patient thought sight a little better, but the gain, if present, did not hold.

June 7. No improvement seen with ophthalmoscope. Vision l. p.

June 14, 1914. Patient returns with vision l. p. and loss of projection.

Result: Failure.

DISCUSSION

This case presented an uncomplicated detachment of the retina, and except for the extent of the detachment should have been favorable for operation. The absence of reaction was doubtless due to the fact that the choroid was not incised, thus making infiltration impossible.

Visual Field. Field in left eye (Fig. 2) showed nearly all upper half gone, and peripheral contraction except down. Only small area below macula shows color perception.

Medical Examination.—Wassermann negative. Arterial sclerosis; blood pressure 166. Urine shows a few hyaline casts; otherwise negative.

Treatment.—July 3, 1913, trephine operation for detachment of the retina; choroid not incised.

July 11: No reaction followed the operation. No improvement in vision.

Ophthalmoscopic examination showed marked improvement in extent of detachment, the upper portion being two disk diameters below disk margin.

Form Field (Fig. 3): Slight improvement. Vision 2/60.

Result: Improvement in field. Vision unchanged.

DISCUSSION

This case presented a detachment of unknown origin of eight months' duration, complicated by degeneration of the vitreous. The choroid was not incised and no reaction followed the operation. While the vision remained the same, the visual field taken with a 10 mm. object was larger than the original one taken with a 30 mm. object.

Case 3.—*History.*—H. H.,[1] male, aged 46, came to the ophthalmic clinic of the University of Michigan September 23, 1913, complaining of a progressive loss of vision in the left eye, which began one year previously as a crescent-shaped shadow, convexity downward, in the upper part of the visual field. There had been no trauma, no pain, no photophobia.

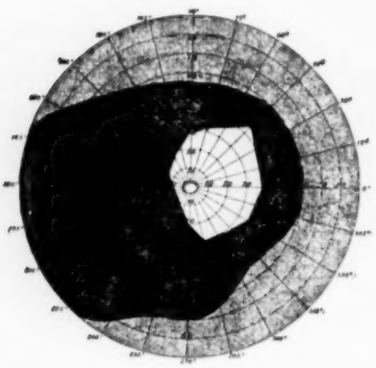

Fig. 1.—Case 1. Field before operation. May 13, 1913. Vision, light perception. Candle field. Left eye.

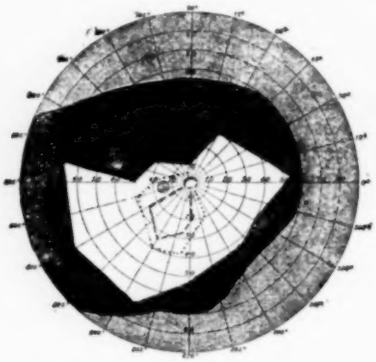

Fig. 2.—Case 2. Field before operation. Left eye. June 24, 1913. Vision, 2/60; 30 mm. object. In this and following figures solid line represents green, dotted line red, and dash line blue.

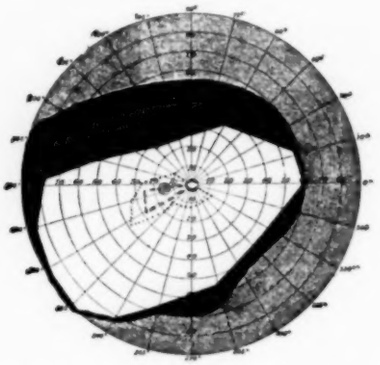

Fig. 3.—Case 2. Field after operation. Left eye. July 14, 1913. Vision, 2/60; 10 mm. object.

Case 2.—*History.*—E. T., male, aged 67, presented himself at the clinic June 23, 1913, complaining of cloud effect before the left eye coming on eight months previously. Vision now blurred; large floaters constantly present.

Family history negative. Personal history, hernia; gonorrhea thirty years ago. No history of trauma.

Examination.—Vision, right eye, 5/15; left eye, 2/60. External appearance of eye and conjunctiva normal. Pupillary reflexes active in both eyes. Tension normal. Transillumination negative. Wassermann negative.

Ophthalmoscopic Examination.—Right eye: Lenticular cortical opacities; many floating opacities in vitreous, both large and small, reticular and granular. Disk and retina edematous, foveal reflex faint; two corkscrew-like macular vessels; there were some slight atrophic changes in the choriocapillaris.

Left eye: Beginning lenticular cortical opacity; many floating opacities of vitreous, fine granular and reticular in character. Inferiorly, retina detached; nasally, detachment extends from a level above the disk slightly downward, following lower border of disk, thence temporally and upward at an angle of 45 degrees.

Diagnosis.—Right eye, incipient senile cataract. Left eye, incipient senile cataract and extensive detachment of retina, involving all except superior quadrant.

Family and personal histories: Negative.

Examination.—Vision, right eye, 6/15; left eye, 4/60. Pupillary reflexes normal. Tension normal. No external pathology in either eye.

Ophthalmoscopic Examination.—Right eye: Some fine and reticular vitreous opacities; otherwise media clear. Physiologic depression present, lamina cribrosa showing faintly. Disk slightly edematous. Arterial reflex stripe most conspicuous in macular vessels. Arteriovenous compression with some distal dilation; foveal reflex present.

Left eye: Innumerable fine dust-like opacities in vitreous; few larger and rounded, all of same type, but variable in size. Disk hyperemic; physiologic depression present; lamina cribrosa faintly seen; scleral and choroidal rings blurred. Arterial reflex stripe conspicuous. Silver wire macular artery nearly developed just above fovea. Retina about disk hyperemic and swollen, whole retina edematous. Below fovea, retina is folded and floats free from choroid. Detachment extends from about one disk diameter below disk downward and outward as far as can be seen.

1. Published in Archives of Ophthalmology, September, 1914.

Visual Field. Field (Fig. 4) showed marked contraction in superior nasal portion.

Medical examination negative.

Operation.—Oct. 16, 1913, scleral trephining operation performed.

Postoperative History.—During the night the patient complained of some pain and the conjunctiva became very much congested, swollen and edematous, the chemotic conjunctiva covering the limbus completely. The eye was iced for twenty-four hours.

After five days the swelling and chemosis were greatly reduced except at the site of operation, which showed bulging for five days longer, at the end of which time the eye was quiet and the stitches were removed.

Fundus examination made three weeks after operation showed many minute granular opacities in vitreous. Whole fundus slightly hyperemic; retina somewhat edematous. Arteriovenous compression present. Superior macular vessels showed silver wire characteristics. Very slight if any foveal reflex; macular region practically normal except slightly granular about the fovea. A glistening white spot with a bright annular whitish line nearly surrounding it was seen about three or four disk diameters temporally and about one disk diameter from the fovea. No area of detachment could be discovered, the retina being apparently completely reattached.

Three weeks after operation vision in left eye 6/15, and field for form and color nearly normal in extent.

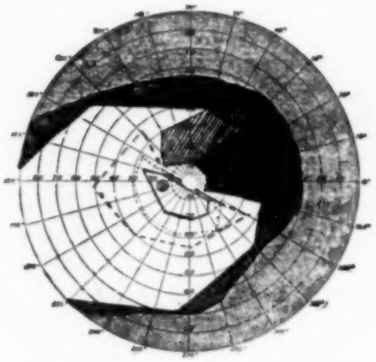

Fig. 4.—Case 3. Field before operation. Left eye. Sept. 23, 1913. Vision, 4/60; 10 mm. object.

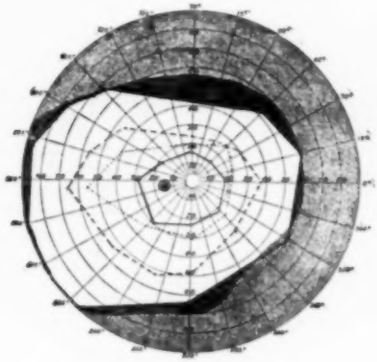

Fig. 5.—Case 3. Field after operation. Left eye. March 29, 1915. Vision, 5/7.5; 10 mm. object.

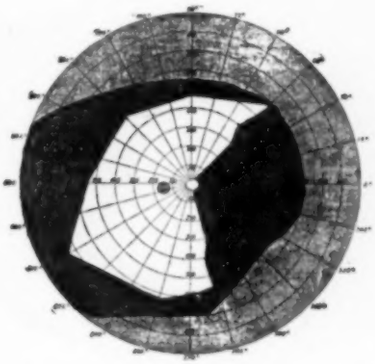

Fig. 6.—Case 4. Field before operation. Left eye. Oct. 28, 1913. Vision 1/120; candle light.

Refraction: Left eye +0.50 sphere. Tension: Right eye, 20 mm. mercury; left eye, 20 mm. mercury.

The last observation, made seventeen months after time of operation, showed vision 6/7.5, tension 20 mm. mercury both eyes, and visual field nearly normal (Fig. 5).

Ophthalmoscopic Examination.—Same as three weeks after operation.

Result: Good after seventeen months.

DISCUSSION

The etiology in this case was unknown, although a well marked neuroretinitis was present, with many fine dust-like vitreous opacities. The detachment was of one year's duration and involved about the lower one-third of the retina. A marked reaction followed the operation and did not entirely disappear for ten days. Although there was an escape of a small amount of vitreous, no trace of an incision in the retina could be found. The vision improved from 4/60 to 6/7.5 pt. and the field to practically normal.

CASE 4.—*History.*—M. K., male, aged 62, entered the University Hospital, Oct. 15, 1913, with a history of having undergone an operation for cataract on the right eye seven years previously. On the third day a hemorrhage occurred, followed by an inflammation and loss of vision. The vision in the left eye has gradually diminished until on admission the patient was nearly blind.

Family History.—Father had cataracts in both eyes.

Personal History.—Negative.

Examination.—Vision, right eye nil, left 1/120; projection very poor. Tension, right eye, 8 mm.; left, 15 mm. Whole lens of left eye more or less granular and irregularly opaque. A well-marked iris shadow was present. Transillumination negative.

Oct. 16, 1913. Combined operation for cataract extraction. Moderate loss of fluid vitreous.

October 23. Pupil well dilated, coloboma free, eye quiet and in good condition.

Ophthalmoscopic Examination.—October 27. Left eye: Retina detached temporally and down; elevated 6 diopters; retinal vessels traced over detachment, which fluctuates with eye movements. Retinal vessels tortuous. Disk borders indistinct. Whole retina edematous.

Visual Field (Fig. 6): Large nasal and marked temporal contraction.

Nov. 21, 1913. Typical ophthalmoscopic picture of detachment of retina, including whole lower portion of globe. Transillumination negative.

November 24. Trephine operation for detachment of the retina opening in sclera, down and out. Choroid and retina incised with cataract knife after removal of scleral disk. Moderate amount of fluid escaped, followed by several drops of thin vitreous.

November 26. Slight reaction followed the operation; eye quiet.

Ophthalmoscopic Examination.—Detachment of retina more extensive.

March 29, 1914. Vision l. p. Candle field improved nasally; not changed temporally (Fig. 7).

The detachment in this case apparently followed the loss of fluid vitreous sustained at the time of operation for removal of cataract. The condition of the vitreous together with the rapid increase in the extent of the detachment from October 23 to November 21 made the case an unfavorable one for any operation.

CASE 5.—*History.*—M. B., female, aged 40, entered the hospital, Dec. 4, 1913, complaining of specks before right eye during past nine months, with progressive loss of vision. There had been no trauma, no pain or photophobia.

Family History.—Mother and one brother had cataracts.

Personal History.—Negative.

Examination.—Vision, right eye, fingers at 3 feet; left eye, 6/5. Pupillary reflexes normal; tension, right eye, 22 mm.; left eye, 24 mm. Transillumination negative.

Ophthalmoscopic Examination.—Right eye: Lens clear, many fine vitreous opacities, mostly posterior. Disk hyperemic, lower border blurred, elevated and continuous with detachment of retina. Localized area of proliferating retinitis

just outside macula, with radiating folds and bands. Whole inferior half of retina detached and drawn into folds.

Left eye: Lens clear, floating opacities of vitreous, mostly long and thread-like; slight arteriovenous compression.

Visual Field (Fig. 8): Entire absence of right upper field, with marked peripheral contraction.

Medical examination, negative.

Operation.—Dec. 11, 1913, trephine operation for detachment, choroid and retina incised. December 15, marked chemosis, extending to fornix, followed operation.

December 25, eye quiet.

Ophthalmoscopic Examination.—Retina reattached, except immediately below macula and in extreme periphery. Fields (Fig. 9) show marked improvement, excepting large scotoma corresponding to area of proliferating retinitis. Vision, fingers 6 inches.

Result: Vision same. Marked improvement in fields.

DISCUSSION

The failure to improve the vision in this case could be accounted for by the nearly central proliferative changes in the retina.

Case 6.—*History.*—E. S., female, aged 36, entered the clinic Dec. 22, 1913, complaining of loss of vision in the right eye, especially below. First noticed four years ago when it was nearly as marked as at the present time.

Family history, negative.

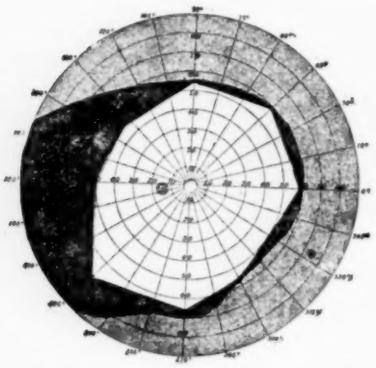

Fig. 7.—Case 4. Field after operation. Left eye. March 29, 1914. Vision, light perception. Candle field.

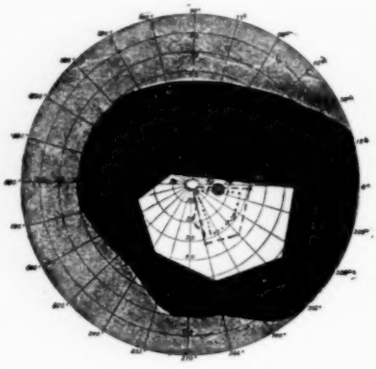

Fig. 8.—Case 5. Field before operation. Dec. 4, 1913. Vision, fingers at 3 feet; 10 mm. object.

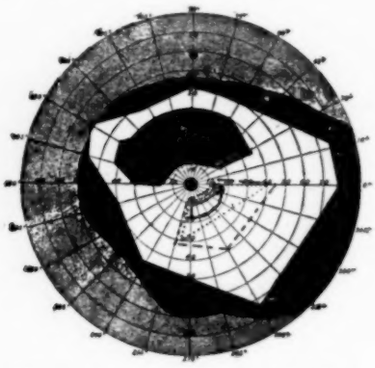

Fig. 9.—Case 5. Field after operation. Right eye. Vision, fingers at 6 inches; 10 mm. object. Dec. 22, 1913.

Personal History.—Struck in the right eye when aged 12.

Examination.—Vision, right eye, 1/60; left eye, 5/10. Pupillary reflexes normal. Tension, right eye, 16 mm.; left eye, 16 mm. Transillumination negative.

Ophthalmoscopic Examination.—Right eye: Media clear. Disk edematous. Arteries tortuous, arteriovenous compression present. Center of fovea shows cherry red spot surrounded by grayish ring which marks beginning of an area of elevation which extends downward and outward. Area of detachment retains nearly normal color and choroidal interspaces show temporally. Both choroid and retina appear to be detached in lower outer quadrant. Left eye: No gross lesion.

Visual Field (Fig. 10): Field taken with 10 mm. object shows marked contraction for form up and nasally, and slight contraction temporally. Color fields present only in outer lower quadrant.

April 2, 1914. Admitted to hospital. On ophthalmoscopic examination the findings were confirmed.

Operation.—April 6, 1914, trephine operation for detachment of retina performed. Choroid and retina incised. The escape of a moderate amount of fluid was followed by some loss of vitreous. Slight edema of conjunctiva followed the operation.

Postoperative History.—April 8, eye quiet. Pupil well dilated.

Ophthalmoscopic Examination.—Area of detachment somewhat diminished. Whole retina more edematous. Detached area grayish in color and distinctly tesselated. Choroidal interspaces clearly seen through retina, and elevated only 3 or 4 diopters.

Visual Field (Fig. 11): Visual fields taken April 23, 1914, showed nearly complete restoration of form fields and very marked increase in size of color field. Vision, O. D. 5/60, O. S. 5/4.

DISCUSSION

The marked improvement in the visual fields in a case of detached retina of four years' duration is of special interest.

Case 7.—*History.*—J. S., male, aged 64, entered hospital, May 8, 1914, complaining of loss of vision in both eyes for the past three years, following a kick in the face by a horse.

Family history, negative.

Personal History.—No constitutional diseases.

Examination.—Vision, right eye, fingers at 3 feet; left eye, l. p. Tension normal. Transillumination negative. Right eye, well advanced senile cataract.

Ophthalmoscopic Examination.—Left eye, large number of floating opacities in vitreous. Disk outline obscured at nasal border by fold of detached retina. Arteries small, veins tortuous, marked arteriovenous compression. Retina detached throughout with exception of upper outer quadrant.

Visual Field (Fig. 12): Candle field showed marked contraction up and in.

Operation.—May 15, 1913, trephine operation for detachment of retina; opening made down and out 12 mm. from limbus. Choroid and retina incised. On second day following operation, eye quiet. Fundus could be seen with S + 1.00 diopter lens. On fourth day, detachment had reappeared and could be seen plainly with S + 7.00 diopter lens. Candle field, taken on fifteenth day after operation, nearly identical with one shown in Figure 12.

May 29, trephine operation repeated; a moderate amount of fluid escaped.

June 12. Marked reaction followed operation.

Ophthalmoscopic Examination.—Many fine vitreous opacities. Disk blurred and edematous. Retina no longer overlaps disk border, whole detachment appearing less in amount. Form field, 10 mm. object. Figure 13 shows marked increase over candle field. Vision, fingers at 3 feet.

Result: Fields improved. Vision unchanged.

DISCUSSION

The condition of the vitreous alone could account for the failure to improve the vision in this case. The final field, taken with a 10 mm. object shows a decided improvement over the first, taken with candle.

Case 8.—*History.*—D. D., male, aged 28, presented himself at the hospital May 19, 1914, complaining of rapid failure of vision in the right eye for one year. Now nearly blind. Thirteen years previously the patient was struck in left eye, which resulted in immediate loss of vision in that eye. Later a

cataract developed which was removed five years prior to admission without restoration of sight.

Family history, negative.

Personal History.—Treated for syphilis.

Examination.—Vision, right eye, l. p.; left eye, blind. Projection in right eye good. Tension normal. Pupillary reflexes: Right eye reacts moderately to direct, slightly to consensual stimulation. Left reacts to consensual only.

Ophthalmoscopic Examination.—Right eye: Beginning cortical cataract. Many vitreous opacities. Disk obscured, located only by convergence of central vessels. Retina detached throughout lower half. Detached portion of retina in folds with contraction bands present, both nasally and temporally. In places, detached portion of retina nearly normal in color, giving appearance of an associated detachment of choroid. Left eye: Lens absent. Total detachment of retina.

Visual Fields: Right eye (Fig. 14), form field, taken with a 20 mm. object, showed absence of nasal field with marked peripheral contraction temporally.

Medical Examination.—Positive Wassermann. Leukoplakia and adenopathy. Given salvarsan.

Operation.—June 1, 1914, trephine operation for detachment of retina performed. Opening in sclera made down and out about 12 mm. from limbus; choroid incised. No escape of fluid followed removal of scleral button, but a large amount of amber colored fluid followed incision of choroid.

Postoperative History.—Considerable reaction followed operation, but no complications. Twenty-eight days after operation the field (Fig. 15) taken with a 20 mm. opening, was more contracted than before operation.

Nov. 12, 1914. Vision, l. p. Lens cataractous. Candle field (Fig. 16) about the same as field taken previously with 20 mm. object.

November 20. Trephine operation repeated. Marked reaction followed, but cleared up without treatment, leaving eye quiet after ten days, with the exception of some chemosis at site of trephine opening. Filtration good.

Dec. 20, 1914. Eye quiet. Vision, barely l. p. Field could not be taken, due to opacity in lens.

Result: Failure.

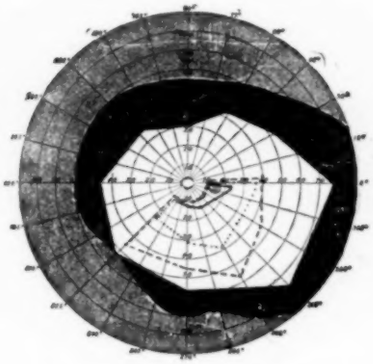

Fig. 10.—Case 6. Field before operation. Right eye. April 23, 1914. Vision, 5/60; 10 mm. object.

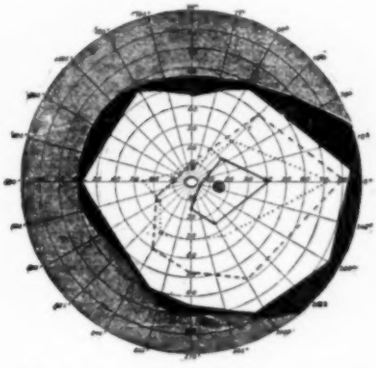

Fig. 11.—Case 6. Field after operation. Right eye. Dec. 12, 1913. Vision, 1/60; 10 mm. object.

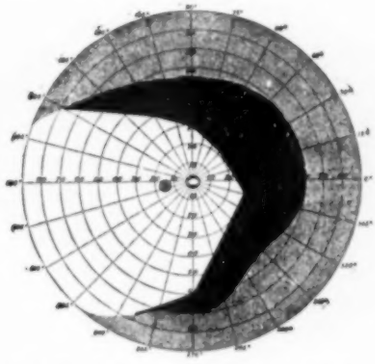

Fig. 12.—Case 7. Field before operation. Left eye. May 14, 1913. Vision, light perception. Candle field.

DISCUSSION

The condition of the vitreous, the presence of organized bands in the retina, together with the general condition of the patient, made this a most unfavorable case for operation. Apparently the formation of the cyclitic cataract was hastened by the operation.

CASE 9.—*History.*—L. W., male, aged 14, presented himself at the clinic, May 19, 1914, with a history of loss of vision in left eye following blow on head three months previously. Was struck in same eye by fragment from dynamite cap three years previously.

Examination.—Vision, right eye, 5/5; left eye, l. p.; divergent, 20 degrees. Tension both eyes normal. Reflexes present, but restricted in left eye.

Roentgen-ray examination shows presence of foreign body posterior to sclera opposite superior temporal quadrant. Transillumination, negative.

Ophthalmoscopic Examination.—Right eye, normal; left, a few fine radiating lenticular opacities present. Two long organized bands (like retinal striae in appearance) hang from superior portion of vitreous; exact source not made out. Below disk several bands running downward in vitreous, similar to those seen above. Disk blurred, rings absent except down and out. Arteries contracted, veins engorged and tortuous. Central area blurred, obscuring all details. Down and nasally the retina and choroid detached 8 to 10 diopters, while down and temporally retina only detached.

Visual Fields (Fig. 17): Right eye normal. Left eye, marked contraction taken with 50 mm. object (20 mm. object not visible).

Medical history, negative.

Operation.—May 25, 1914, trephine operation for detachment of retina performed. Opening in sclera made directly down. Moderate outflow of clear fluid followed incision in choroid. Very slight reaction followed operation.

Postoperative History.—Thirteen days after operation, vision was 1/60. Field of vision (Fig. 18) much improved. Taken with 20 mm. object.

Ophthalmoscopic Examination.—Made sixteen days after operation. White bands observed at first examination unaffected. Temporally many vertical wrinkles and folds in retina. Along inferior nasal vein a striation apparent, not visible before operation. Detachment appreciably lessened below, especially temporally. Four weeks after operation detachment had same appearance as at last examination. Lamina cribrosa could be seen, however, and vision was 2/60.

July 3, 1914, thirty-nine days after operation, vision, 2/60. Field (Fig. 19) taken with 20 mm. object, more contracted above.

July 6, 1914, trephine operation repeated, opening being made down and out. Small amount of fluid escaped after incision in choroid.

July 10, 1914. Chemosis was slight.

July 25. Vision, 4/60. Field (Fig. 20) taken with 10 mm. object, much improved up and nasally.

Aug. 10, 1914. Vision, 5/60. Field (Fig. 21) taken with 10 mm. object, more contracted nasally, holding temporally.

November 8. Vision, 2/60. Detachment more marked below.

November 9. Trephine operation repeated second time. Sclera opened down and slightly cut. Moderate amount of fluid escaped after incision in choroid.

Dec. 1, 1914. Vision, 3/60. Field (Fig. 22) taken with 10 mm. object; marked contraction; somewhat smaller than first field taken with 50 mm. object. Eye quiet.

Ophthalmoscopic Examination.—Appearance same as after first operation.

Result: Slight improvement.

DISCUSSION

The organized bands in vitreous and retina made this case unfavorable from the first. The temporary improvement following the first operation led to the hope that some permanent gain might be made. The final improvement, however, was very slight.

Case 10.—*History.*—J. S., female, aged 21, presented herself at the clinic, Nov. 11, 1914, complaining of sudden total loss of vision in right eye nine days previously. After four days she could distinguish light; now sees objects. No trauma. No pain.

Examination.—Vision, right eye, fingers at 4 feet; O. S. 1/60, W. C. 6/15. Tension both eyes, normal. Pupillary reflexes: Right eye, almost absent to direct, active to consensual. Left eye, active to direct, nearly absent to consensual. Both react in accommodation.

Ophthalmoscopic Examination.—Right eye: Many fine vitreous opacities. Disk indistinct, seen best with S — 12.00 D. Whole lower portion of retina detached, most elevated immediately below macular region seen with S + 5.00 D lens. Superiorly, fundus somewhat tesselated. Left eye: Media clear, disk vertically oval, seen best with S — 12.00 D. Myopic crescent along lower temporal border with myopic choroidal changes in macular region. Peripheral portion of fundus tesselated.

Visual Fields (Fig. 23): Candle field; contraction temporally and above.

Treatment, rest in bed.

Nov. 18, 1914. Vision, 4/60. Visual field, 10 mm. object, less contraction than former candle field. Small field for blue; red and green not attempted.

November 29. Vision, 6/40.

Ophthalmoscopic Examination.—Unchanged. Visual field not more contracted than at last examination.

Operation.—Nov. 30, 1914, trephine operation for detachment of retina performed. Scleral opening made down and out. Escape of yellowish colored fluid followed incision in choroid.

Postoperative History.—Slight injection and edema over trephine area. Twelve days after operation, eye quiet. Ophthalmoscopic examination showed marked improvement, retina replaced, excepting peripherally, down and in. Vision, 2/60.

Jan. 11, 1915. Vision, 5/60, with and without correction. Many thread-like and mossy vitreous opacities, apparently remnants of hemorrhage. Retina detached below. Fields, 10 mm. object. Practically the same as field shown in Figure 23.

March 26, 1915. Vision, right eye, fingers at 2 feet.

Ophthalmoscopic Examination. — Marked increase in extent of detachment now extending up and in, down to disk border, and up and out, to superior temporal artery, which seems to limit the detachment. Vitreous contains many fine and a few stringy opacities. Disk obscured.

Visual Field (Fig. 24): Field taken with a 10 mm. object shows marked loss in all directions, especially temporally.

Result: Failure.

DISCUSSION

The interesting feature in this case is the associated myopia. No other etiologic factor could be found as a possible cause of the detachment.

Case 11.—*History.*—M. W., female, aged 64, presented herself at the clinic, Feb. 8, 1915, complaining of loss of vision in left eye. Five months previously first noticed flashes of light before eye, which gradually disappeared. One month later, vision was practically lost for a period of from two to three weeks, when sight returned for objects, where it has since remained.

Examination.—Vision, right eye, W. C. 6/7.5. Left eye, fingers at 2 feet. External appearance of both eyes, normal. Pupillary reflexes, normal. Tension, right eye, 25 mm.; left eye, 22 mm. Transillumination negative.

Ophthalmoscopic Examination.—Right eye: Few striae in lens periphery. Few fine vitreous opacities. Peculiar flaky retinal changes of indefinite character over whole fundus. Otherwise negative. Left eye: Lens swollen and granular. Many fine reticular vitreous opacities. One large central opacity. Retina detached from just below disk border temporally and down. Peripherally detached portion of retina, grayish; centrally pale red.

Visual Fields: Right eye, slight contraction above; left eye (Fig. 25) with 30 mm. object, upper nasal half practically hemiopic. Marked peripheral contraction throughout.

Medical examination, negative.

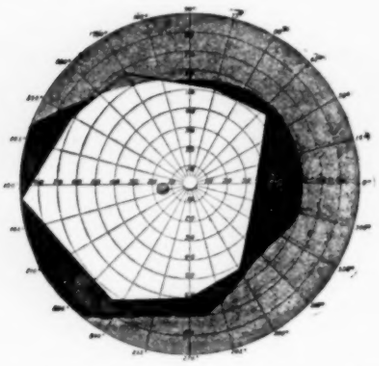

Fig. 13.—Case 7. Field after operation. Left eye. June 11, 1913. Vision, fingers at 3 feet; 10 mm. object.

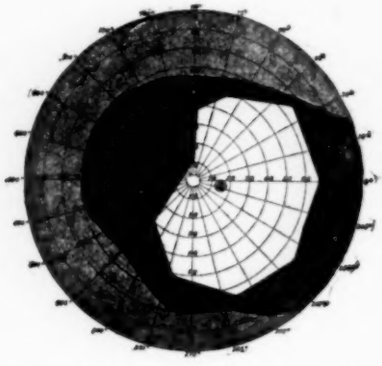

Fig. 14.—Case 8. Field before operation. Right eye. May 19, 1914. Vision, light perception; 20 mm. object.

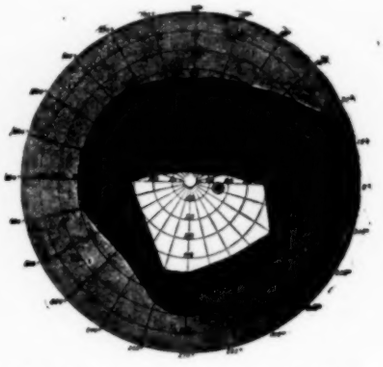

Fig. 16.—Case 8. Field after second operation. Right eye. Nov. 14, 1914. Vision, light perception. Candle.

Operation.—February 15. Trephine operation for detached retina performed. Several drops of straw-colored fluid and a small amount of vitreous followed incision of choroid and retina.

Postoperative History.—Considerable congestion and chemosis over trephine area. At end of ten days patient could see much better, counting fingers readily. No exact record made. On eleventh day, chemosis had disappeared. Apparently filtration had ceased. Vision much worse. Visual fields (Fig. 26) 10 mm. object larger than first taken with 30 mm. object. Most marked improvement nasally where hemiopic character of field had disappeared. Vision: Counts fingers at 3 feet.

DISCUSSION

The final field taken with a 10 mm. object showed a marked improvement over the first one taken with a 30 mm. object. The failure to secure a more marked improvement in vision could be accounted for, in part, at least, by the changes of the lens and vitreous.

SUMMARY OF RESULTS

Vision			Fields	
Improved	Unimproved	Made Worse	Improved	Made Worse
4	5	2	8	3

In three cases (3, 5 and 7) very good results were obtained. In Case 3 the vision was increased from

4/60 to 6/7.5 and the field almost completely restored. The last observation was made seventeen months after the time of operation. In Case 5 the field was almost completely restored except for a large central scotoma which corresponded to an area of proliferating retinitis, accounting for no increase in the acuity of central vision. In Case 7 the field was greatly improved, but the condition of the vitreous was such as to prevent improvement of vision.

The vision was made worse in two cases (4 and 10). Case 4 had a fluid vitreous, a portion of which had been lost one month previously during operation by me for the extraction of cataract. Case 10 had a high degree of myopia.

The field was made worse in three cases (1, 8 and 10). In Case 1 the detachment was very extensive and the choroid was not incised. Case 8 had contraction bands in the retina and a partial detachment of the choroid. There was also present a total detachment in the other eye and the Wassermann was positive. Case 10 had a high degree of myopia with a spontaneous detachment.

In three cases (6, 8 and 9) the detachment of the retina was associated with a partial detachment of the choroid. In Case 6 there was a slight improvement by a marked edema which did not entirely disappear until the tenth day.

The procedure seems to be unattended by any danger, either of impairing the integrity of the globe, or, in uncomplicated cases, of increasing the extent of the detachment. On theoretical grounds at least it would seem desirable to drain off the subretinal fluid without injuring the retina. In the cases reported, however, the best results were obtained when escape of the subretinal fluid was followed by a discharge of a small amount of vitreous.

The results obtained in the eleven cases here reported, as compared with those obtained from any like number of cases previously treated, compel the author to look on the operation as one of distinct value in the treatment of detachment of the retina.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. THOMSON AND CURTIN, AND PARKER

DR. CLINTON T. COOKE, Seattle: I take direct issue with the statement that Vail's theory fits certain clinical aspects of the case. Has Vail shown conclusively that the hypotony is due to arrest of secretion and not to a free exit of aqueous through a patent ligamentum pectinatum? Minus ten-

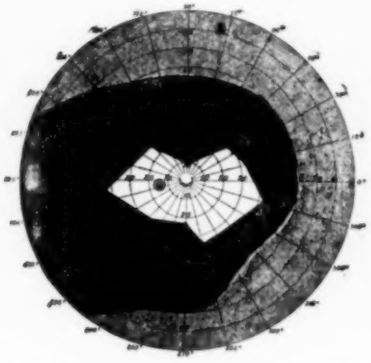

Fig. 17.—Case 9. Field before operation. Left eye. May 22, 1914. Vision, light perception; 50 mm. object.

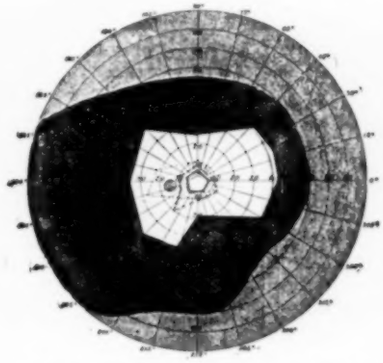

Fig. 18.—Case 9. Field after first operation. Left eye. July 7, 1914. Vision, 1/60; 20 mm. object.

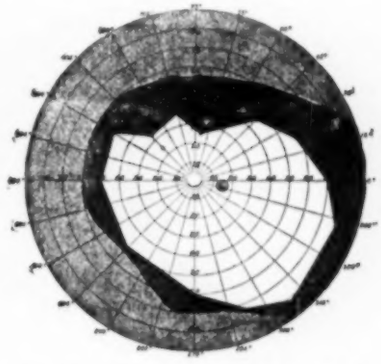

Fig. 23.—Case 10. Candle field before operation. Right eye. Nov. 29, 1914. Vision, 4/60; 10 mm. object.

in the vision and a marked improvement in the field both for form and color. Case 8 was unfavorable for any operative procedure, while Case 9 showed slight improvement after the second operation in both vision and fields. The organized bands in the vitreous in Case 9, the result of a foreign body passing through the globe, made any marked improvement impossible.

In two cases (1 and 2) the choroid was not incised. In each case the vision was unchanged, while the field was slightly improved in one and made worse in the other.

The object of this operative procedure has been to secure an opening in the sclera and choroid which will allow free drainage of the subretinal fluid for a sufficient length of time to permit the retina to become reattached. If the secretory process is dormant, and all the subretinal fluid evacuated at the time of the operation, reattachment may occur without edema of the conjunctiva. But if the secretory process is active, or if any amount of the subretinal fluid is left behind, a certain amount of reaction must necessarily follow or the retina will again be separated from the choroid and failure result. In each of the cases in which a good result was obtained, the operation was followed

sion is an undoubted fact. But has he shown the necessary connection between it and arrest of secretion? As to "Passive hyperemia with albuminous transudate, beneath the retina," does the assumption of the arrest of secretion and minus tension require us to assume also that the subretinal albuminous fluid is transudate, brought about mechanically, and is not an inflammatory exudate of toxic origin? It is possible for contraction of volume of the vitreous to occur in at least three ways; by a general loss of its water, by a formation of circumscribed areas or cavities in its substance, by a liquefaction of its peripheral portion, from a diffusion to it from the choroid of a toxin, or by reason of an interference with its supply of nutriment plus liquefaction. In either case its place is taken either by aqueous or by transudate or exudate, or else the sclera contracts on it. If this latter does not occur, room is afforded for the subretinal accumulation if the channels for aqueous escape are unblocked. How an albuminous transudate of choroidal origin is to bring about diffusion of water from the vitreous to the choroidal side of the retina in the face of an alleged acid reaction, I fail to see. Vail's treatment by sodium citrate is based on its alleged acid reaction. Fischer finds that even a slight acidity causes a rise in tension equal in certain concentrations to an amount sufficient "to burst the great sclera" and that the change or reaction is a most important factor in producing a rise in tension in glaucoma. I think Vail does not follow Fischer. Furthermore, I think

that Fischer's work effectually disposes of Vail's theory. In my opinion, the theory of Drs. Thomson and Curtin is vastly preferable. With the rest of the paper I am in agreement, particularly where they call attention to the not infrequent association of a subchoroidal exudate with the subretinal fluid; that is, of a choroidal detachment. This accords with a case recently observed by myself and operated according to the technic of Dr. Walter Parker, in which I trephined over the site of detachment and observed the gush of fluid before puncture of the choroid. This patient secured increase of vision and partial reattachment of the retina. In the future I contemplate following the technic of the authors of this paper, although I see no reason, even in the cases of subchoroidal exudate, to defer aspiration of the subretinal fluid to a subsequent time.

DR. VARD H. HULEN, San Francisco: The operation presented by Dr. Parker, and that described by Dr. Curtin are the same excepting the aspiration, which does not appeal to me. We are distinctly in need of some method of treatment for detachment of the retina which is really hopeful. Nothing heretofore, in my experience, has been of that nature. Dr. Parker performed his first operation within a few days of the date on which I had recommended the same procedure to a patient, the idea having occurred to me independently some time before as it probably had to others.

I have one experience only to report and it appears favorable to this operation. This patient, female, aged 46, came to me in July, 1911, stating that she had noticed a blur over her right eye for four or five years or longer. At this visit her vision was 20/70. The field, irregular, roughly; nasal 30 C.; temporal, 50 C.; up, 20 C.; down, 30 C. The eye appeared normal except that the ophthalmoscope revealed a small, typically appearing detachment of the retina above and to the temporal side, 8 diopters in elevation. While the location was not usual for detachment and the outlines exceptionally clear cut and its height rather great for its area, I proposed the usual treatment for simple detachment. Later, no constitutional or local cause having been discovered, I mentioned a growth as a possible cause of the detachment. Negative results having followed nonoperative treatment, scleral punctures were proposed. The vision having dropped to 16/200 I suggested in June, 1913, the operation as now described by Dr. Parker. The tension has always been normal and conditions unchanged excepting some increase in the detachment with floating opacities in the vitreous. Many months elapsed and then the patient returned and said great failure of vision had recently followed a pelvic operation under ether. I then found the entire lower half of the retina detached. May 10, 1915, I trephined the sclera below and to the temporal side 10 mm. from the limbus. A large quantity of typical subretinal fluid escaped on the withdrawal of the trephine. The lower detachment was completely dissipated, but the first "detachment" remained unchanged. As no reaction followed and the vision was now 10/200, I suggested as a final measure the same procedure over the site of above and this was done June 9. In sharp contrast to my first experience, the trephining was followed by the loss of no fluid, and incising the dark object through the opening caused merely a little oozing of blood and there was a feeling of resistance. I now thought the diagnosis of sarcoma of the choroid confirmed and proposed immediate enucleation. To date this has been declined though strongly urged in addition by two of our most skilled confréres. Neither of them, however, will make a positive diagnosis of tumor from their examination of this eye. The retina below remains attached, media and "tumor" unchanged, eye quiet, but the contrast in appearance of the two trephined areas calls for radical and immediate action. My experience with this case encourages me to try this operation again in cases of simple detachment. One point in the technic recommended by Dr. Parker's comparatively large experience I feel should be accepted with caution, for it may be a mistake to puncture the retina as a routine procedure. To evacuate the subretinal fluid by trephining, without injuring the retina or the loss of vitreous, the eye, I believe, has been put in the most favorable condition for recovery.

DR. G. C. SAVAGE, Nashville, Tenn.: Let every man bear the consequences of his own sins. I bear reproach myself for using the citrate of sodium subconjunctivally. I want to say in defense of Vail that I believe his theory is the only one that should appeal to us. Any change in the eye that will lessen the contents of the vitreous body would predispose to the detachment of the retina. The watery constituents of the eye go into the vitreous and aqueous chambers and are emitted slowly as a secretion. Any other fluid such as a transudation of serum in the eye would make the eye opaque. The ciliary glands, like any other glands of the body, might fail in secretory power, and thus fail to keep the chambers of the eye properly filled. Not knowing about Vail's line of thought I promptly wrote him that I had never cured a case. About that time a young man came from Vanderbilt University complaining of loss of vision in one eye. The diagnosis was easily made—simple detachment of the retina. I said to him if I knew the reaction of the detaching fluid I might be able to do something for him. His vision was practically nothing. He said: "Take advantage of your guess that it is acid and do whatever you want to do for me. I do not want to lose my eye." I gave the citrate of sodium by subconjunctival injection, with marvelous improvement within twelve hours. These were repeated frequently, improvement continuing. It has been about three years, and that man is now able to read ordinary print. The injection of citrate of sodium was what brought about the improvement. I concluded that something ought to be done to improve the nutrition of the eye so I gave him 1/100 grain of mercuric chlorid and 1 grain of potassium iodid after each meal. I then wrote Vail again that I was curing a case. Later I found that his theory and my practice fitted into each other perfectly. In the past three years I have had more cases of detachment of the retina than in all my other years of prac-

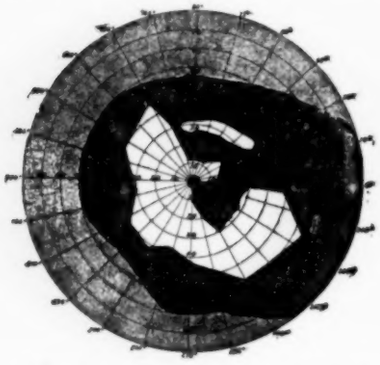

Fig. 24.—Case 10. Field four months after operation. Right eye. Vision, fingers at 2 feet; 10 mm. object.

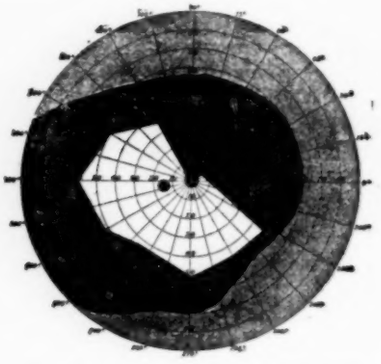

Fig. 25.—Case 11. Field before operation. Left eye. Feb. 12, 1915. Vision, fingers at 4 feet; 30 mm. object.

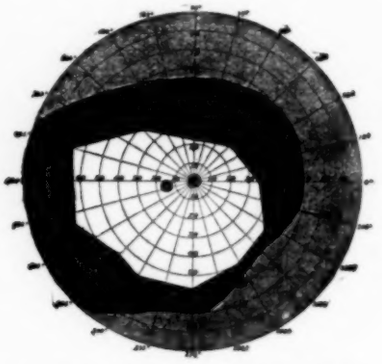

Fig. 26.—Case 11. Field one month after operation. Left eye. March 4, 1915. Vision, fingers at 3 feet; 10 mm. object.

tice. Some cases have not improved at all. Cases that had clear vitreous improved. Some improved very remarkably, others less remarkably, and I believe all patients with clear vitreous would have gotten well if they had persisted in the treatment, including the agents that I believe are best for improving the nutritive power of the ciliary body. Vail in his theory of causation is right.

DR. MILTON K. THOMPSON, Muskogee, Okla.: I had a peculiar case. I want to make this report and get the opinion of the elders such as Dr. Savage and others. The patient suddenly went blind. The ophthalmic examinations showed a distinct retinal detachment of a rounded character, but we did not know what nature of a tumor it was. Several of us decided it was a tumor. On questioning the young man we found that he had a specific history. We put him on treatment with neosalvarsan and inside of a month's time the tumor had gradually gone down and he had very good vision, except central, at the point of tumor where the choroidal scar showed. Now I want to know why that did that way and what condition existed?

DR. KASPAR PISCHEL, San Francisco: I would like to express my gratitude to Dr. Parker for the very accurate table he has presented. He shows his failures there along with his successes—the bad as well as the good. The results are good enough for us and we should all try it. I shall certainly do so at my first opportunity. Naturally I will use the trephine or trepan in connection with the dental engine which I showed this morning. The trepan on the dental engine works so much faster and, with my stop, is so much safer that I will never return to Elliot's original hand trepan.

DR. THOMAS H. CURTIN, New York: Dr. Thomson and I wish to apologize for simply recording three cases, but we have recorded only those cases which we thought were applicable for this operation, namely, recent cases of spontaneous or traumatic origin. We have operated in ten or twelve cases, however, in which from the outset we expected no results, although we have, even in these cases, had improvement in the fields of vision. Just before I left New York a patient with myopic detachment with vague light perception in the upper field, after being operated on twice, had a vision of fingers at 4 feet. In answer to Dr. Cook, I wish to say that we do not try to defend Dr. Vail's theory and have founded our belief as to the causation of retinal detachment on the results of our own clinical experience. I want to say, regarding the operation, that we think it is a bad plan to puncture the retina in any operation for the cure of retinal detachment. Holt, in 1911 in the *Transactions* of the Ophthalmic Section at Heidelberg, did trephining for myopia with and without detachment. He came to the conclusion that patients who had tears in the retina gave no results from the trephine operation. In regard to subconjunctival injections, as has been stated in the paper, we have consistently and conscientiously used them. We have tried various solutions, saline, dionin, citrate of soda, cyanid of mercury and glycerin and none of them has given us the least result.

DR. WALTER R. PARKER, Detroit, Mich.: Cases of detachment of the retina due to intra-ocular tumor were not included in my report. Dr. Savage has been more fortunate in his results from subconjunctival injection than many others. Certainly if medical treatment will cure detachment of the retina, surgical interference should not be thought of. Personally I have never permanently cured a case of detachment, except by the method described in my paper. Trephining the sclera alone has been done before, but the results were unsatisfactory. My suggestion is to combine an incision of the choroid with the trephine operation.

Authority to Compel School Inspection.—The objection that the state has no right to permit or require medical inspection of the children in the schools will not bear close scrutiny or logical analysis. The authority which has the right to compel attendance at school has the added duty of insisting that no harm shall come to those who go there.—*Wisconsin State Board of Health Bulletin*, April-June, 1915.

METHODS OF WEIGHING PARTS OF THE LIVING HUMAN BODY*

C. D. SPIVAK, M.D.
DENVER

The problem which I essayed to solve can be better understood if I recite the course of reasoning I followed: A man weighing 150 pounds is placed on a certain diet and he gains 10 pounds. The question arises, How can we locate the gain? In other words: How have the 10 pounds distributed themselves over the body? Have they spread themselves uniformly through the body or not? If the additional mass has not been distributed uniformly, is there a definite relative increase in the various sections of the body? Have 3 pounds been added to the upper extremity and 7 pounds to the lower extremity or vice versa? The same question is, of course, applicable to a man who has lost 10 pounds. As far as I could trace in the available literature, not only has there never been made an attempt to solve this problem, but it has never even been propounded.

The student of metabolism differentiates between the increase in the mass of the body which takes place during the period of growth and the increase in the mass of the body which takes place after the period of growth has terminated. The first growth is a fundamental biologic property implanted in the race and transmitted by heredity. It is involuntary. The second, the increase in mass after growth has ceased, is wholly artificial and may be influenced by diet, exercise, environment, etc. It is to a great extent under control and therefore voluntary. I am concerned with the latter only.

Now, the increase in mass manifests itself in two ways, in weight and in measure. The result of the added 10 pounds has hitherto been measured by means of the scales and the tape measure. Neither of these methods is capable of throwing light on our problem. The scales show an increase in the body of 10 pounds, but they do not show where they are located. The measurements made by the tape, no matter how carefully made and how numerous, will not give even an approximate idea of the increase in the bulk either of the entire body or of a part of the body.

As the development of the art of measurement is older than the art of weighing, so has the solution of the problem dawned on me first through the glimmering light of measure.

Having evolved a method of measuring the bulk of the whole human body and of its certain parts and sections by means of the volumometer, and having also suggested the use of a new ponderal index in anthropometry,[1] I naturally turned my attention to the actual weighing of parts of the living human body. Here the difficulties, mechanical, physical and mathematical, confronted me at every step, and I have made but slow progress. I have consulted physicians, engineers and mathematicians. They all became attentive and interested, and, to use a hackneyed expression, sat up and

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

1. Spivak, C. D.: The Specific Gravity of the Human Body, Arch. Int. Med., April, 1915, p. 628.

took notice. But alas, they gave me only much warmth and but little light.

I have constructed scales for weighing parts or sections of the living human body which consist of (*a*) a board, (*b*) a stand and (*c*) two ordinary platform scales.

The board is 7 feet long and is provided on its lower surface with two transversely grooved steel bars running alongside of its margins.

The stand is made of an iron frame, the upper surface of which ends in a knife-like projection which fits into the grooves of the bars and serves as a fulcrum.

The board is placed on the fulcrum in about its middle portion, and the two scales are so placed that each of the two extremities of the board rests on or is suspended over their platforms. The scales on which the longer arm of the board is resting will indicate a certain amount of weight, and, by shifting the board to the right or to the left, one is able to adjust it so that neither of the scales will indicate any weight. The board then will be balanced, or in other words, the center of gravity of the board will have been determined. The scales represent a lever of the first order.

Now when a man weighing, say, 150 pounds, is placed on the balanced board, the upper extremities in the anatomic position, one or other of the scales will indicate a certain amount of weight. By shifting the subject to the right or to the left we are able to adjust it so that neither of the scales will indicate any weight, or, in other words, the center of gravity of the man in the horizontal position will have been determined. We then mark on the body of the subject the line of the center of gravity. We shift the subject a distance (*a*) to the right of the fulcrum, and we note the amount indicated on the right hand scales, and then we shift the subject a distance (*b*) to the left of the fulcrum, and we note the weight indicated on the left hand scales. From the known quantities (1) the weight of the entire body, (2) the center of the gravity, (3) the distance *a* and the distance *b* and (4) the two weights when the body is shifted to the right and to the left, we should be enabled to find the unknown weight of the part of the body on either side of the fulcrum. Dr. I. J. Schwatt, professor of mathematics at the University of Pennsylvania, to whom I submitted the problem was kind enough to prepare the following four equations:

Given the four equations:

(1) $W(l-d) + P_1x = W_1d + P_2y$
(2) $W(l-d-a) + P_1(x-a) = W_2(d-a) - P_2(y+a)$
(3) $W(l-d+a) + P_1(x+a) = W_2(d-a) + P_2(y-a)$
(4) $P_1 + P_2 = P$

Required to solve for the unknowns, P_1, P_2, x and y.

SOLUTION[3]

First, eliminate y, as follows:

Add (1) and (2).

(5) $\therefore W(l-d) - Wa + 2P_1x - P_1a = d(W_1 + W_2) - W_2a - P_2a$

Add (2) and (3).

(6) $\therefore 2W(l-d) + 2P_1x = (d-a)(W_2 + W_2) - 2P_2a$

Second, eliminate x, as follows:

Subtract (5) from (6).

(7) $\therefore a(W + P_1) = \frac{d}{a}(W_2 - W_1) - a(W_2 + W_2) + a(W_2 - P_2)$

Solve (7) for P_1.

(8) $\therefore P_1 = \frac{d}{a}(W_2 - W_1) - (W + W_2 + P_2)$

Substitute (8) in (4).

$$\therefore \frac{d}{a}(W_2 - W_1) - (W + W_2) - 2P_2 = P_1$$

$$\text{i. e., } P_2 = \frac{1}{2}\left\{\frac{d}{a}(W_2 - W_1) - (W + W_2 + P)\right\}$$

Substitute this value for P_2 in (8).

$$\therefore P_1 = \frac{1}{2}\left[\frac{d}{a}(W_2 - W_1) - (W + W_2 - P)\right]$$

Hence from (6)

$$x = \frac{a[d(W_1 + W_2) - 2W(l-d) + a(W - W_2 + P)]}{d(W_2 - W_1) - a(W + W_2 - P)}$$

And from (1)

$$y = \frac{a[d(W_2 - W_1) + a(W - W_2 + P)]}{d(W_2 - W_1) - a(W + W_2 + P)}$$

3. The solution was kindly prepared by Dr. G. E. F. Sherwood, Professor of Mathematics, School of Mines, Golden, Colo.

In conclusion, I desire to beg of you to consider all that I had to say in reference to the weighing of parts of the living human body as merely preliminary. I may be right and I may be wrong. I may be wending my way to the land of the Eureka, or I may be drifting into a fool's paradise. I do not know.

1421 Court Place.

ABSTRACT OF DISCUSSION

DR. T. BRAILSFORD ROBERTSON, Berkeley, Calif.: I would like to ask Dr. Spivak whether, in order to measure his new ponderal index, it is necessary totally to immerse the subject?

DR. JOSEPH ERLANGER, St. Louis: I would like to know how much of a factor in the measurement of the mass of the body changes in the distribution of the blood in the body may be, and also how much of a factor variation of the gaseous content of the cavities of the body may be, and whether these factors have been taken into account by Dr. Spivak?

DR. C. D. SPIVAK, Denver: The new ponderal index which I recommend is made up of the old ponderal index, which represents the ratio between the height and the weight of the body in air, and the volume of the body measured in water. The new ponderal index takes cognizance of the specific gravity of the body as one of the trinity of measurements. The problem of weighing parts of the human body is to be solved by engineers and mathematicians and may be represented as follows: Given a mass of homogenous consistency, we can judge the weight of any of its parts by measuring or weighing the amount of water which that part displaces. Given a mass that is not symmetrical and not homogenous in consistency, wanted to find the weight of certain sections of that body: I claim that mathematics and mechanics will jointly come to our assistance and give us, if not the exact weight of such parts, at least an approximate weight.

The question of the specific gravity of the body has been studied very carefully, mainly by the Germans. There is an article in English by an American, a teacher of swimming, who studied the question from his particular standpoint. Professor Spitzig of Cleveland informs me that he and Rev. Frederick Odenbach of St. Ignatius College of Ohio City have carried on investigations and they have arrived at the conclusion that the specific gravity of the human body is so low that it takes only a little bit of buoyancy to keep it afloat, which is in perfect accord with my findings. The question as to whether the air in the lungs has any influence on the specific gravity has received due consideration at the hands of German investigators. It was found that the volume of air in the lungs equals the volume of air in the intestines, and consequently there is a perfect balance between the specific gravity of the two halves of the body—that above and that below the diaphragm.

CHRONIC RETENTION OF URINE IN CHILDREN *

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During the past five years a number of children[1] suffering from chronic vesical urinary retention have come under my observation. Invariably the condition had been unrecognized, and the children were steadily deteriorating in health. As the picture presented by these cases seems to be quite characteristic, even though the etiology of the condition may vary from case to case, I have thought it well worth while to report this series and to call attention to the syndrome.

The picture presented by these cases is very suggestive of chronic interstitial nephritis. The patients become pale and pasty. Frequently they are apathetic. Usually there is some difficulty in urination. The little patients complain of pain, or their parents note that they take a long time to complete the act. In some cases the straining is so great that the patient shows collapse symptoms with excessive pallor and weakness. On physical examination a globular mass is felt in the hypogastrium; it varies in size, but never disappears spontaneously. If infection is present, the mass may be tender. When a catheter is passed, this tumor vanishes. There is regularly residual urine. The walls of the bladder are hypertrophied, though this may not be evident late in the disease when excessive dilatation takes place. On palpation one may feel the bladder contract and become hard, behaving like the pregnant uterus. If no infection has set in, the urine may be clear, suggesting the urine in chronic interstitial nephritis. Eventually all the patients seem to become infected. As a secondary and constant development, the ureter openings become patulous and the ureters dilated. Unilateral or bilateral hydronephroses develop, and the enlarged kidney or kidneys become palpable. With infection setting in, the kidneys partake of the trouble, and infected hydronephrosis with or without multiple abscesses develops.

Neurologic examination of these patients frequently shows nothing abnormal; in others, distinct evidence of a cord or of a brain lesion is found. Even in cases in which the most complete examination fails to reveal a definite disturbance in the nervous system, postmortem examinations (three cases) have shown definite cord lesions.[2] Many of the cases without neurologic signs so closely simulate those with definite neurologic symptoms, as well as those adult cases of contracture of the neck of the bladder, due to some neuromuscular disturbance (arteriosclerosis of the cord, poliomyelitis, etc.), that, reasoning from analogy, one feels compelled to view these cases as due to neurologic disturbances, provided no local physical obstruction is present.[3]

In some cases a local examination may demonstrate an obstruction at the prepuce or in the urethra (stricture, folds, new growth). This should regularly be excluded, if possible. A minute meatus may be associated with a neuromuscular disturbance and, as in one of the following cases (Case 3), have nothing to do with the retention. The ready passage of an instrument into the bladder probably precludes the possibility of a mechanical obstruction, whereas, in conditions of sphincter spasm, such as most of these cases probably are, no obstruction is usually felt. This corresponds to the adult cases as well as to similar spasms in other parts, notably cardiospasm.[4] That the condition is frequently one of spasm (or perhaps better disharmony between the detrusor and sphincter muscles or relative hypertonicity of the sphincter) can frequently be demonstrated by passing a good-sized bougie into the bladder after the patient has voided. As soon as the sphincter is well stretched and the bougie is withdrawn, the bladder may be emptied voluntarily (except in cases with a diverticulum, etc., as Case 2). Again, that the detrusor is not paralyzed can be readily proved by starting the stream by forcible expression. After the sphincter spasm has been overcome the patients may void in a good stream.

Roentgenographic studies of these cases with silver salts will regularly show a fair-sized bladder and dilated ureters, provided the condition has lasted a sufficient time. If the cause of the retention is a diverticulum (Case 2), the Roentgen-ray cystograph will readily assist in making the diagnosis.

From the foregoing it is clear that these cases present a definite clinical picture due to varied etiologic factors. Before reporting and analyzing the series here brought together, it would be well to tabulate the etiologic factors:

1. Mechanical obstructions:
   - A. Extravesical, as congenital folds and strictures, including tight prepuce, small meatus, etc.; new growths.
   - B. Intravesical, as diverticulum of bladder, vesical stone.
2. Neuromuscular:
   - A. Brain disease.
   - B. Spinal cord disease.
   - C. Spasticity of sphincter without definite neurologic signs;[2] probably disease of sacral cord.

The cases due to extravesical obstruction are well known, and in the literature there are many examples of such cases.

CASE 1.—*Chronic retention of urine; congenital stricture in penile urethra; dilatation. Cured.*—Boy, aged 7 years, since the age of 2 has been dribbling urine. Has no pain. No trauma or local disease. Physical examination shows a large, tense globular mass filling the hypogastrium. On catheterization this disappears. The meatus of the urethra is small. No neurologic symptoms are present, and no evidence of a neuromuscular disturbance can be detected. The urine is cloudy, albumin is present, also an occasional hyaline cast, and many pus and red blood cells. The Roentgen examination shows no calculus.

Meatotomy was performed, and 1½ inches behind the meatus a stricture was detected. This was stretched and

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1. The opportunity to study three of the following cases, I owe to Drs. A. G. Gerster and H. Koplik, for which I take great pleasure in thanking them. In addition to the nine cases included in this series, I have seen several other cases belonging in this group, but as they were not adequately studied, they have been excluded from the report.

2. Blum, V.: Zur Kenntnis der Harnretention im Kindesalter und zur Frage der Pyocyaneussepsis, Wien. med. Wchnschr., 1907, lvii, 2257.

3. The series of cases has been so arranged as to emphasize this interpretation, which I trust will convince even in those mentioned in Legueu's paper (Arch. urol. de Necker, 1913-1914, i), where the changes in the urinary tract in these cases are attributed to a probable congenital anomaly or malformation of the ureters, etc. In Bransford Lewis' recent analysis of similar cases in adults (Prostatic Obstruction and Vesical Atony, Ann. Surg., March, 1915) he announces the same conclusions which I have reached.

4. The analogy between cases of cardiospasm and those under discussion is quite striking. An esophageal probe, stomach tube, etc., can be passed over a silk thread (Mixter technic) through the spastic cardia without the operator detecting any obstruction. Here, too, the obstruction leads to dilatation of the passage above, and the dilated hypertrophied esophagus may assume enormous proportions.

kept open with an indwelling catheter (No. 12 French). October, 1913: After catheter had been used in this way for fourteen days, patient was able to empty his bladder and was discharged.

Much rarer are cases of chronic retention due to intrinsic conditions, as diverticula, which is well illustrated in Case 2.

Case 2.—*Chronic retention of urine; diverticulum of bladder; excision; reimplantation of left ureter. Cured.*—Boy, aged 10 years, five or six days before admission had slight terminal hematuria and pain on urinating. He feels that he cannot empty his bladder. Has some pain in hypogastrium. The patient is markedly pale. The hypogastrium is filled by a globular mass which does not disappear completely after urination. There are a penile hypospadias and slight right lumbar tenderness. The neurologic status is negative. The urine is turbid, and contains a heavy trace of albumin, much pus and many epithelial cells. The residual urine is between 60 and 90 c.c. Phenolphthalein test shows 45 per cent. excretion in two hours.

March, 1915: Argyrol cystograph shows a well-developed diverticulum of the bladder and a dilated right ureter. The diverticulum is as large as a peach, and appears to be a little to the left of the midline and behind the bladder.

March 24, 1915: Cystoscopy shows that the right ureter meatus is patulous. Near site of left ureteral meatus is the opening of the diverticulum. The left ureter seems to open into the diverticulum close to the mesial lip, as indicated by the discharge of indigocarmin in good concentration. The right kidney excretes a good stream well colored at fourteen minutes.

March 27, 1915: Extraperitoneal excision of diverticulum of bladder and reimplantation of left ureter in bladder. The bladder was exposed in the usual way through a suprapubic incision, and dissected free from the peritoneal covering. The bladder was gradually drawn into the wound, and the diverticulum found to lie between the trigon and the rectum. As the lower 1 inch of the left ureter was intimately adherent to the diverticulum, it had to be sacrificed and excised with the inflamed diverticulum. The position of this pouch was such that, whenever it was full, it compressed both ureters, and in that way induced bilateral hydro-ureter (and nephrosis). At operation both ureters showed evidence of this, and the left was found markedly dilated. (Roentgenoscopy revealed condition on right side.) The ureter (left) was implanted in the posterior wall after ligating the neck of the diverticulum and burying it in the bladder wall. A suprapubic Kader cystostomy for drainage was made, and when the drainage tube was withdrawn, the cystostomy opening (valvular) closed at once without leakage.

April 26, 1915: Urine is clear. Bladder is completely emptied and patient is absolutely well.

May 12, 1915: Cystoscopy shows excellent function of the ureteroneostomy, which looks like a small, red, nipple-shaped protrusion of mucous membrane on posterior wall, and through its central lumen an intense stream of indigocarmin is emitted in normal fashion.

As illustrative of the neuromuscular group of cases with retention of urine due to a definite discoverable lesion in the nervous system, let me cite the following case under Group 2 A, due to cerebral disease:

Case 3.—*Retention of urine; Little's disease; spastic sphincter of bladder.*—Boy, aged 6 years, complained of difficulty in urinating. Patient was born by face presentation, asphyctic, remaining so for one and one-half hours. Anuria followed, lasting a week (?), and thereafter dribbling. At 2 years of age there was pain on urination. At 3 years of age he began to walk. Parents noticed that left side of body was weak. Patient must urinate frequently and strains so hard as to cause weakness, pallor and general distress. He was an underdeveloped, pale, pasty-looking boy, suggesting chronic nephritis.

Local examination showed a small meatus. In hypogastrium was a hard tumor, extending well up to the umbilicus. It disappeared on catheterization. Meatotomy was performed without changing the condition. Kidneys were negative.

Neurologic examination revealed weakness of left side of body, bilateral Babinski, apparently the residue of a Little's (or left cerebral hemiparesis).

Cystoscopy May, 1912, revealed a trabeculated bladder. Delayed excretion of indigocarmin in feeble concentration.

A diagnosis of retention of urine due to neuromuscular disturbance (sphincter spasm of cerebral origin [Little's]) was made. Diminished kidney function (beginning bilateral hydro-ureter and hydronephrosis).

An attempt was made in this case to overcome the spastic sphincter by progressive dilatation with bougies. After these had been passed, the patient was able to empty his bladder. This was kept up for some time, No. 18 French being used.

March, 1915: Patient was again seen. He had the peculiar pallid appearance of a nephritic. Bladder was two-thirds to umbilicus, and on straining the patient could void only one-half ounce of urine, which was perfectly clear. Neurologic signs of left hemiparesis persisted.

The following case illustrates very satisfactorily the group in which the chronic retention is associated with a well-marked and readily detectable spinal cord lesion, or Group 2 B.

Case 4.—*Retention of urine; incomplete transverse myelitis.*—Boy, aged 11 days, was born by foot presentation, and was delivered by traction (midwife). On the eleventh day parents noticed that he failed to pass urine. Physical examination showed a large globular hypogastric mass which disappeared on catheterization.

Neurologic examination revealed both lower extremities paralyzed. The flat muscles of the abdominal wall, especially on the right side, were paralyzed. Bilateral Babinski and exaggerated knee jerks were readily elicited. Examination of the spine was negative. Subsequent Roentgen examination of the spine was also negative.

Owing to absolute retention, the little patient had to be catheterized every twelve hours for several weeks, when some urine (overflow?) was voided. Catheter always entered without striking an obstruction. When the patient was 3 months old there was slight improvement in the neurologic symptoms, but no marked change in urinary retention. The bladder was always palpable, filling the hypogastrium; it contracted firmly under the palpating hand, and on pressure urine could be expressed. As soon as the stream was started, that is, the spastic sphincter overcome, the baby was able to void in a good stream. The urine up to date shows no sign of infection of the urinary tract.

In my experience, by far the largest group of cases of chronic retention of urine in children shows no other symptoms referable to the nervous system, though in the only two cases hitherto recorded which have come to complete necropsy, the sacral segments of the spinal cord showed definite lesions:

Case 5 (v. Blum, Frankl-Hochwart).[2]—Boy, aged 13 years, wets himself day and night. When 3 years old he had acute attack with tonic and clonic spasms, unconsciousness and urticaria. This lasted one day. He was always weakly and nervous. In the fifth year, he fractured his frontal bone above the right eye and had concussion. Then he was four weeks in bed. Subsequently he had scarlet fever. No disturbance in urination was noted until tenth year, when increased frequency and urgency developed. When 11½ years old, there was hematuria with pains in kidney regions. This disappeared after rest, but ever since there has been incontinence with dribbling and hypogastric pain.

Physical examination, Jan. 21, 1907, reveals an underdeveloped boy, looking about 6 or 7 years old. Pallor of skin and mucous membranes. In hypogastrium there is a rounded protrusion extending above umbilicus, produced by a full bladder. No obstruction to catheter's passage through

urethra (No. 14 French). Urine is clear, no albumin, specific gravity 1.006; microscopically, many leukocytes and flat epithelial cells.

Neurologic status is negative except for exaggeration of knee jerks and ankle clonus. On passing catheter into bladder, patient voided 200 c.c. under good pressure, and on withdrawing catheter, patient voided another 40 c.c. in good strong stream.

Patient became infected and died of pyocyaneus sepsis.

Necropsy showed no obstruction in the urethra, cystitis, bilateral infected hydro-ureters and hydronephrosis together with other septic foci.

In the spinal cord (Professor Obersteiner) definite changes were found in the lower sacral segments (see original). These consisted of pathologic changes in the anterior cornua as well as of a congenital anomaly of the central canal.

CASE 6 (Frankl-Hochwart).—Boy, aged 15 years, antecedents psychopathic. Patient weakly, underdeveloped. As a child had enuresis. Since one year, pains in glans penis and incontinence. Bladder was chronically distended and was expressible. Uremia led to death.

In posterior urethra, necropsy revealed a moderately developed semilunar fold (apparently out of proportion to the symptoms). Trabeculated bladder, dilatation of both ureters and pelves of kidneys. Spinal cord shows moderate dilatation of central canal and definite degenerative changes in the anterior cornua, second to fifth sacral segments.

The close analogy between these cases and those which follow, as well as the observation of similar spastic sphincter activities in adults in connection with spinal cord disease, suggests very strongly that the cases of Group 2 C are due to isolated disease of the sacral cord (sympathetic centers?).[5] Until we obtain more necropsies of these cases, the final proof will be lacking. Unfortunately, up to date I have been able to obtain only one cord (but no peripheral nerves, etc.) in this type of case (Case 8), and though this was not complete, the evidence it offers is very striking and corroborative of the foregoing point of view.

The end-result of all these cases, if nothing is done to relieve them, is infection of the kidneys and death. Under this Group, 2 C, I wish to describe briefly five cases. The first case presented some signs of a neurologic disturbance, and serves as a good link between Group 2 B and Group 2 C.

CASE 7.—*Chronic retention of urine; bilateral pyonephroses; uremia.*—Man, aged 23, was very small at birth ("as long as a spoon") and was blue. Great efforts had been made to keep the patient alive. He was always very feeble. For fifteen years prior to his death his urine had been milky. Examinations showed this due to pus. Of late there had been some pain on urination and some bleeding. During the six months prior to his death, he began to show signs of failing kidney function, increasing pallor, drowsiness, weakness and apathy.

Patient was admitted in wretched shape. Respirations were exceedingly frequent and fairly deep and noisy. Pulse very feeble. Mind perfectly clear. General twitchings; very little urine secreted. Blood pressure 145 mm. Blood urea markedly increased. Cerebrospinal fluid was clear. Urine was full of pus; no sugar and no acetone.

Neurologic examination revealed both knee jerks markedly exaggerated; there were bilateral ankle clonus, left-sided Babinski and bilateral Kernig. Wassermann positive.

The patient soon became unconscious and died uremic.

Necropsy showed marked hypertrophy of the bladder, which was trabeculated and inflamed. The ureter openings were patulous, and both ureters and kidneys distended and infected (bilateral infected hydronephrosis). Careful examination of the urethra showed no mechanical obstruction. Unfortunately, the cord could not be examined.

CASE 8.—*Chronic retention of urine; pyo-ureteronephrosis.*—Boy, aged 4½ years, has always had bladder trouble, more or less retention and dribbling. Hypogastric mass noted two weeks before admission. Passes urine frequently and has marked thirst. Two weeks ago fell down and after that parents first noted distended bladder.

Physical examination reveals a pale, underdeveloped child, with aged facies. In hypogastrium an ovoid mass, tense, elastic, feeling like a full bladder. Urine can be expressed by pressure on mass.

Neurologic status is negative.

Temperature is from 102.4 to 103.8 F.

Roentgenoscopy of spine for spina bifida occulta[6] was negative.

To relieve condition, patient was catheterized regularly, and from 250 to 450 c.c. were obtained.

Repeated attempts to relieve the spasm at the bladder neck with papaverin (from one-fifth to one-half grain) failed. Residual urine remained between 4 and 5 ounces.

Patient began to have higher temperatures, and a permanent catheter had to be inserted. No obstruction was encountered at any time in passing catheters. Subsequently patient developed right costovertebral tenderness, and urine became more and more turbid. Phenolphthalein test 15 per cent. in two hours.

Patient lost ground rapidly and died within two weeks of admission, despite permanent catheter and bidaily or daily irrigations.

No complete necropsy was permitted, but a small part of the lower spinal cord was obtained and examined by Dr. I. Strauss, who reports as follows:

There is a degeneration of both pyramidal tracts. The sections are about third, fourth and fifth sacral segments. Sections of the cauda equina show no root degeneration.

CASE 9.—*Chronic retention; hypertrophied bladder; bilateral hydronephroses.*—Boy, aged 15 months. Physical examination reveals a globular tumor mass in the hypogastrium. It is always present except when emptied by a catheter, that is, distended, hypertrophied bladder. In left lumbar region is a mass corresponding to the position of the kidney. This is probably a hydronephrotic organ. No neurologic symptoms were elicited.

Cystoscopy (February, 1912) reveals bladder trabeculated, otherwise normal. No obstruction in urethra. Indigocarmin does not appear until four and three-quarters hours after injection, which suggests a bilateral kidney involvement.

Diagnosis of chronic retention, hypertrophied bladder, bilateral (probably) hydronephroses, due to spasm of vesical sphincter.

CASE 10.—*Chronic retention of urine; pyonephrosis.*—Boy, aged 5½ months. Normal birth in 1910. Globular tender mass presented in hypogastrium, a trifle more marked on right side than on left. With the impression that this was an abscess (appendicular), an exploratory incision was made. This incision demonstrated that the tumor was a full bladder, and it was emptied with a catheter. The bladder filled again and remained distended throughout our observations; residual urine approximately 60 c.c. Later a mass developed in the left kidney region which proved to be an infected pyonephrosis.

No neurologic symptoms were elicited.

CASE 11.—*Chronic retention; bilateral infected hydro-ureters and hydronephroses.*[7]—Boy, aged 5 years, had a fever four months before admission. Shortly thereafter there were blood in urine and in stools (prolapse?), and pain in right lumbar region. Condition had gradually become worse.

Physical examination was negative. No neurologic symptoms were elicited. Urine contained pus and pyocyaneus bacilli.

5. In patients who have had infectious diseases, for instance, diphtheria, in making the diagnosis the possibility of a detrusor weakness due to chronic peripheral neuritis should be borne in mind.

6. Compare case of Muchamisky: Urolog. Jahrb., 1913, p. 403.

7. This case has been rather fully reported by Henry Heiman: A Case of Bilateral Hydroureter, Chronic Pyocyaneus Infection, Arch. Pediat., November, 1913, and by Leo Buerger: Congenital Hydroureter and Hydronephrosis, Internat. Clin., iv, Series 24.

Aug. 16, 1911: Cystoscopy and bilateral ureter catheterization. Bladder full of purulent urine washed clean before introduction of small cystoscope. Left ureter opening is patulous and seen to discharge purulent urine (infected hydronephrosis, tuberculosis?). Right ureter meatus is slit-shaped, normal. Indigocarmin excretion is negative in forty-five minutes, speaking probably for a bilateral renal involvement. Both ureters catheterized. Urine from right kidney was clear, from left, many pus cells, no tubercle bacilli, no growth on culture mediums.

As repeated examinations failed to show tubercle bacilli, the patient was treated with bladder irrigations, and urine became less purulent. Autogenous vaccines (from bladder urine) were also employed.

In August, 1912, the child was again admitted. There was a residual urine of 4 or 5 ounces, and urine was turbid with pus.

Almost fourteen months after the first cystoscopy, the second examination was made (Dr. Buerger), and it demonstrated that the condition had progressed. Both ureter openings were now patulous. The left orifice was enormously dilated; the right was also very much enlarged, although it still retained some of the natural outline of a normal ureteral orifice.

The development of the same condition on the right side as had existed fourteen months earlier on the left suggested bilateral hydronephroses and hydro-ureters, and with the aid of an argyrol roentgenogram, this was beautifully verified. At no time did we obtain any evidence of obstruction in the urethra, as all instruments passed into the bladder readily.

The condition of the patient gradually became worse, and in July, 1914, he died.

Necropsy (incomplete) showed bilateral infected hydronephroses. The left kidney was more enlarged than the right and was full of pus. The ureters were also markedly distended and tortuous. Both meatus were much dilated. The bladder was very much dilated, looking like an enormously enlarged adult bladder, and its walls were thinned. The urethra showed nothing abnormal.

Before saying a few words concerning the therapy in these cases, the question arises as to whether a unilateral renal involvement may obtain in this condition. Judging from the cystoscopic examination as well as from the urinary and necropsy findings in Case 11 as well as the course of Case 10, it would seem that the process for a time might be limited to one side or asymmetrically developed. This is of importance in trying to understand a case recently reported from Zuckerkandl's clinic by Bachrach:[8]

CASE 12 (Bachrach).—Woman, aged 27, since childhood never urinated normally. Had to strain and wait at times one-half hour before finishing the act. After exposure, developed cystitis with right kidney pains.

Physical examination showed feeble, atrophic patient. Bladder extended 3 inches above symphysis. Catheter entered easily.

Cystoscopy revealed bladder inflamed, and trabecular hypertrophy with multiple diverticula. Left ureter meatus was normal, whereas the right ureter meatus was patulous. (No neurologic status mentioned.)

Collargol cystograph showed ascent of silver into right dilated ureter and pelvis.

Diagnosis: Infected hydronephrosis and hydro-ureter with "atonic" (Schlaffer) dilatation of vesical orifice.

This case showed what appears to be, but is not definitely proved to be, a unilateral involvement ascribed to atony by the author, basing his interpretation on J. Israel's conception of dynamic as opposed to mechanical obstructions. And this, despite the fact that he states that Israel believes such dilatations follow the repeated futile attempts of the contracting bladder[9] to empty itself in a normal way. The increased intravesical pressure forces one or both ureter openings: ureteral dilatation develops. Superimposed vesical infection probably hastens the process. In Bachrach's case, strange to say, no neurologic data are given. A survey of the essential facts of this incompletely described case will demonstrate a close similarity to the cases reported under Group 2 C. The second case reported in Bachrach's paper, also without neurologic status, presented a picture similar to my cases with bilateral hydro-ureter and hydronephrosis, and seems to belong in this group.[10]

CASE 13 (Bachrach).—Girl, aged 16. Up to fourteenth year nocturnal enuresis. Since beginning of menses that has ceased, but there is difficulty in urinating. After exposure, urine became turbid and frequency developed (every ten minutes).

Physical examination reveals signs of incomplete urinary retention in bladder. Urine is cloudy with pus. Combined kidney function is lowered. (Indigocarmin in thirty-five minutes.)

Cystoscopy reveals trabeculated, inflamed bladder with numerous diverticula. Both ureter openings are widely patulous. Catheterization of ureters reveals a residual urine of from 100 to 120 gm. (partly reflux?).

Roentgenoscopy with collargol reveals ascent of silver salts into dilated ureters and pelves from bladder.

Diagnosis: Bilateral infected hydronephrosis and hydro-ureters with atonic dilatation of ureters.

THERAPY

When we come to treatment of these cases, a distinction must be made between Groups 1 and 2. In cases belonging to the former group, much can be accomplished. Mechanical obstruction, intrinsic and extrinsic, can usually be obviated. If such strictures cannot be reached through the bladder or the perineum, which will be seldom, if ever, a temporizing cystostomy operation will be in place. In cases belonging to Group 2, therapy is pretty well baffled. Medicinal treatment, for example, potassium iodid, perhaps mercury, and antispasmodics (papaverin) will have to be tried, together with dilatation of the sphincter; and if all attempts fail, a cystostomy will be indicated, perineal or suprapubic, with section of the bladder's neck. This operation should be done to save the progressive changes in the ureters and kidneys. Should a kidney become infected, it should be nephrotomized rather than taken out, whenever feasible, in view of the usual symmetrical development of the disease.[11]

48 West Seventy-Fourth Street.

8. Bachrach, R.: Ueber atonische Dilatation des Nierenbeckens und Hartleiter, Beitr. z. klin. Chir., 1913, lxxxviii.

9. Frequently seen in various types of cystitis as well as in neuromuscular disturbances.

10. There are a number of other cases in the literature which appear to fall into Group 2 C, for example, J. Daland's case cited by Osler, in his Practice. From personal communication, Jan. 29, 1915, I learn that no obstruction was found, and the patient had the usual bilateral hydro-ureteronephroses. Unfortunately, no cord examination was made. E. Holt (Diseases of Infancy and Childhood, 1898) describes 8 cases of hydronephroses in 726 consecutive necropsies. In a series of 10 cases, in 7 only the left side was affected, and in 3 both sides. He says this condition is due to obstruction in ureter, bladder, urethra or prepuce, but in only 3 cases could sufficient or adequate obstruction be demonstrated. Double hydronephroses of congenital type result in death within the first year.

11. In addition to the references already given, the following will be found of interest:

Walker, J. W. T.: Atony of the Bladder without Obstruction or Signs of Organic Nervous Disease, Ann. Surg., 1910, lii, 577.

Burkhardt, E.: Handbuch für Urologie, 1906, iii, 1.

C. G. Cumston (Ann. Surg., November, 1910) cites Edes' cases.

A STUDY OF IMMUNITY FOLLOWING THE USE OF TYPHOID VACCINES AND SEROBACTERINS

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In order to gain more information regarding the immunizing value of the various sensitized and nonsensitized typhoid vaccines in use at the present time, a series of experiments on rabbits was undertaken. Following the inoculation with such vaccines, blood was withdrawn at regular intervals, and estimations of the opsonic index and the agglutinating and bactericidal powers were made.

HISTORICAL

Clinicians are generally agreed regarding the immunizing value of typhoid vaccines and serobacterins, and such reports as those of Major Russell, of the U. S. Army, and the numerous data from other armies and institutions are convincing. Occasional failures to obtain immunity, as reported by Trowbridge, Finkle and Barnard,[1] may perhaps be explained by the use of a vaccine improperly prepared or improperly administered.

There is a discord in the opinions of men treating typhoid with vaccines. On the one side we have Elmer[2] and others condemning, and on the other Krumbhaar and Richardson[3] (who collected reports of 1,806 cases) and others recommending their use.

No good index of immunity exists, but a great deal of careful work has been done to throw light on the subject. Estimations of the immune bodies in the blood following the injections of vaccines have been made. In man, Wollstein[4] shows the height of the bactericidal power, and Moon,[5] Wade and McDaniels,[6] and Dyer[7] the height of the agglutinating power to be about two months after the first dose of vaccines. Some serums were negative as early as four months after the first injection, and most of them negative within one year. Still, we know that immunity usually outlasts this period. This resistance is probably due to a degree of sensitization of the body cells. It is also known that persons who have had typhoid fever previously react severely to immunization with typhoid vaccines, probably for the reason just given.

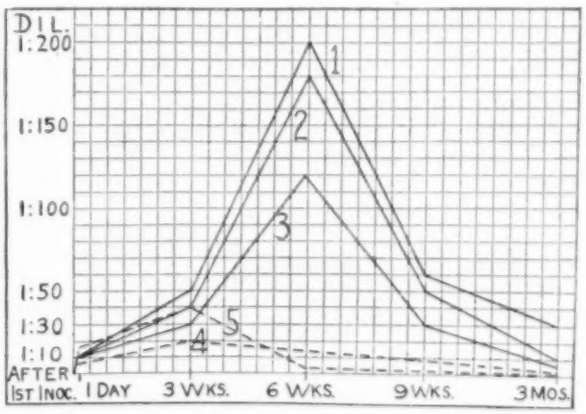

Chart 1.—Agglutinins.

Animal experimentation, though small, has largely borne out the foregoing data obtained from human serum. Freshly isolated cultures of *Bacillus typhosus* do not agglutinate as readily as subcultures, but McIntosh and McQueen,[8] and Gay and Claypole[9] found that inagglutinable strains, when injected into animals, led to the production of typhoid agglutinins which had no action on themselves but agglutinated heterologous strains freely. Johnston[10] found an increase in the bactericidins and a rise in the opsonic index to 4.7 following typhoid vaccination in rabbits. Thus, although there is of necessity a difference in the reactions found in human as opposed to rabbit blood, there is also an analogy.

It has been found by Cecil[11] and Stone[12] that vaccines killed by the addition of phenol (carbolic acid) or tricresol are more potent than those killed by exposure to heat. Cecil[11] also found that sensitized typhoid vaccines when injected intravenously have only one-third the virulence of nonsensitized typhoid bacilli, probably because the former undergo phagocytosis and bacteriolysis more rapidly.

The Besredka sensitized living typhoid vaccine is apparently most active. It does not produce typhoid fever or typhoid carriers if the strain is an old one, as shown by Nichols,[13] Castellani,[14] Metchnikoff and Besredka,[15] the latter having been unable to immunize chimpanzees except with this type of vaccine. In 745 persons whom they vaccinated, no carriers and no cases of typhoid developed.

Nègre,[16] working with rabbits, found that after the use of ether-killed vaccine the serums showed a very high agglutinating power with low bactericidins and antibodies, whereas the living sensitized vaccine produced low agglutinins but high bactericidins and antibodies. Typhoid vaccine killed by heat produced high agglutinins and low bactericidins.

MATERIALS AND METHODS

For this study, twelve rabbits from two litters of about the same age and weight were taken. Two rabbits served as controls, and the remaining ten were divided into pairs, one rabbit from each litter, and were injected intravenously with the following vaccines:

Vaccine 1: This vaccine was prepared by growing typhoid bacilli on agar slants for twenty-four hours, washing off the growth with salt solution, and then killing and standardizing in 0.6 per cent. phenol.

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4. Wollstein, Martha: Jour. Exper. Med., 1912, xvi, 315.
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7. Dyer, A. W.: Indian Jour. Med. Research, Calcutta, April 1, 1914.
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11. Cecil, R. L.: Jour. Infect. Dis., 1915, xvi, 26.
12. Stone, W. J.: Typhoid Immunity and Antityphoid Inoculation, THE JOURNAL A. M. A., Oct. 16, 1909, p. 1253.
13. Nichols, H. J.: Jour. Exper. Med., 1914, xx, 573.
14. Castellani: Lancet, London, Aug. 21, 1909.
15. Metchnikoff and Besredka: Ann. de l'Inst. Pasteur, March 25, 1911.
16. Nègre: Compt. rend. Soc. de biol., 1913, lxxiv, 1177.

Vaccine 2: This vaccine was made as Vaccine 1, but killed by heating at 56 C. (132.8 F.) for one hour, and then standardized in 0.4 per cent. phenol.

Vaccine 3: This vaccine was made as Vaccine 2, but before the bacilli were killed they were washed till the filtrate gave a biuret negative test.

These three vaccines were made from the same strain of typhoid bacillus and standardized by the hemocytometer method, the Helber blood-platelet counter being used. Injections of 500 million, 1,000 million and 1,000 million were given at weekly intervals.

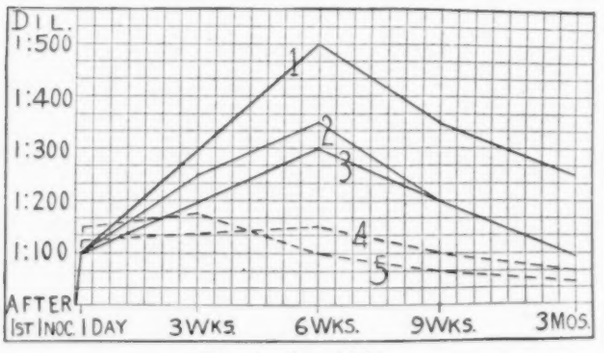

Chart 2.—Bactericidins.

Vaccine 4: This vaccine was kindly furnished by the California State Board of Health. It is sensitized vaccine made according to the method of Gay and Claypole, and given according to their directions in three doses of approximately 750 million typhoid bacilli every other day.

Vaccine 5: This vaccine was the Typho-Serobacterin Mulford immunizing package, bought in the open market. It was administered according to the directions accompanying the package.

The rabbits were kept separated and were fed alike. Rectal temperatures were taken and blood collected at regular intervals. The rabbit's ear was flipped vigorously for a few minutes, washed with xylene and alcohol, and one of the marginal veins punctured; in this way sufficient blood for the test was easily secured. The bacteriologic tests were made on the same day that the blood was drawn.

General reactions, such as a fever of from 2 to 2.5 degrees and loss of appetite for two or three days, occurred in all four rabbits receiving Vaccines 1 and 2, but only after the first injection. There was a slighter reaction in one of the rabbits receiving Vaccine 3, and in the other rabbits receiving the same vaccine the reaction was mild, extending only over the day of administration of the vaccine. There was no general reaction after any succeeding doses, neither was there any sign of general reaction in the rabbits receiving the sensitized Vaccines 4 and 5. The serums were tested with the same cultures of typhoid bacilli from which Vaccines 1, 2 and 3 were made. The agglutinins were tested according to the usual microscopic methods, with a time limit of thirty minutes.

The bactericidins were tested by making progressive dilutions of serum, mixing them with equal parts of a twenty-four hour culture of bacilli, and incubating at 37 C. (98.6 F.) for fifteen minutes. This was plated, and the number of colonies estimated after twenty-four hours. The opsonic index was made according to Wright's method, and 100 cells were counted.

It was found that none of the rabbits before the injection had agglutinins to typhoid, and that the bactericidins were not present above a dilution of 1:5.

The results of the tests for agglutinins, bactericidins and opsonins are given in the accompanying charts; the numerals refer to the vaccines used and are the same as those used above in describing the preparation of the vaccines.

1. Nonsensitized vaccine killed by the addition of 0.6 per cent. phenol.
2. Nonsensitized vaccine killed at 56 C. standardized in 0.4 per cent. phenol.
3. Nonsensitized washed vaccine.
4. Sensitized vaccine, Gay and Claypole method.
5. Sensitized vaccine, Typho-Serobacterin Mulford, Immunizing.

No negative phase was observed in this series. Taken as a whole, both the agglutinins and the bactericidins in this series were lower than those obtained by the majority of other workers. These individual variations can largely be accounted for by the use of different strains of bacteria and some differences in the methods used. The aim of this study has been toward simplicity. It may be possible that the apparent lack of immunity after the administration of sensitized vaccines is due to the fact that the serums were tested with a culture different from that used in the manufacture of the vaccine, that is, the culture from which Vaccines 1, 2 and 3 were made, and with which the serums were tested.

SUMMARY

There is a slight reaction following the injection of nonsensitized vaccines in rabbits, which is absent following the injection of sensitized vaccines.

Vaccines killed by heat seem to be less active than those killed by the addition of phenol only.

Washing the vaccine does not seem especially to influence its immunizing value.

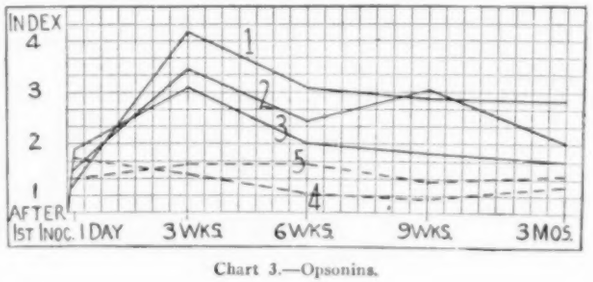

Chart 3.—Opsonins.

The height of the immunity curves occurs earlier after sensitized than nonsensitized vaccines, but the former appear to be only about one fourth as potent.

The agglutinins practically disappear within three months after the first injection, while bactericidins and opsonins can be detected much longer.

Opsonins increase more quickly than do agglutinins and bactericidins.

Opsonins and bactericidins remain more permanent than agglutinins, and immunity is more likely due to the former than to agglutinins.

Sensitized typhoid vaccines are less potent than nonsensitized typhoid vaccines, probably because the bacteria of sensitized vaccines undergo phagocytosis and bacteriolysis more rapidly.

CONCLUSIONS

In conditions in which a prolonged reaction is desired, as in conferring immunity, the nonsensitized vaccines seem preferable.

In conditions in which no general reaction is wanted and a quick response of the protective powers desired, as in active typhoid fever, a sensitized vaccine would seem preferable.

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THE ACETONE BODIES IN DIABETES MELLITUS

INFLUENCE OF LOW AND HIGH PROTEIN INTAKE ON THE EXCRETION OF ACETONE, DIACETIC ACID AND BETA-OXYBUTYRIC ACID

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INTRODUCTION AND REVIEW OF LITERATURE

I have frequently noted that the administration of increased amounts of protein to diabetics often increases the amounts of acetone, diacetic acid and beta-oxybutyric acid excreted in the urine. Magnus-Levy[1] has had a similar experience, and asserts that the increased excretion of the acetone bodies does not mean that they have been formed from the protein but on account of the high protein content of the diet, which makes an extra tax on the oxidizing powers of the body and diverts these from the combustion of the acetone bodies.

It is now firmly settled that the acetone bodies are mostly derived from the fats and especially from the fats composed of the lower fatty-acids.[2] Knoop,[3] Ringer[4] and others have shown that in the catabolism of fatty acids the carbon chains are broken down by the oxidation of the third carbon atom from the end, that is, in the beta position, and the two end carbon atoms are then split off. It follows that two carbon atoms are separated at a time, and therefore every fatty acid which contains an even number of carbon atoms can be converted into beta-oxybutyric acid.

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3. Knoop, quoted by Porges: Ergebn. d. Physiol., 1910, x, 6.
4. Ringer: Jour. Biol. Chem., 1913, xiv, 43, 525.

TABLE 1.—RESULTS OF TESTS *

Case Number	Day	Urine				Intake		
		Glucose, gm.	Acetone, gm.	Diacetic Acid, gm.	Beta-Oxybutyric Acid, gm.	Protein, gm.	Fat, gm.	Carbohydrate, gm.
1	1	1.6	0	0	0	135	220	45
1	2	1.8	0.58	0.42	0	135	220	45
1	3	0	1.22	1.06	3.0	175	220	45
1	4	12	1.34	1.28	2.6	175	220	75
1	5	8	0.52	0.31	+	90	220	75
1	6	0	±	±	0	90	220	45
2	1	80	+	+	...	135	220	10
2	2	78	1.62	0.92	1.3	135	220	10
2	3	74	1.48	1.02	0.9	135	220	10
2	4	77	1.72	1.03	0.8	135	220	10
2	5	77	1.65	0.94	1.2	135	220	10
2	6	83	1.24	0.87	1.1	135	220	10
2	7	67	1.11	0.76	0.7	135	220	10
2	8	82	1.38	0.92	0.9	135	220	10
2	9	70	3.20	2.60	2.3	185	220	10
2	10	82	3.09	2.07	1.9	185	220	10
2	11	70	3.17	1.99	2.4	185	220	10
2	12	60	3.45	3.65	2.9	185	220	10
2	13	70	4.18	2.17	3.4	185	220	10
2	14	46	3.27	2.18	2.7	185	220	10
2	15	80	4.30	3.15	2.9	185	220	10
2	16	68	3.18	2.16	2.3	185	220	10
2	17	65	3.40	2.92	2.1	185	220	10
2	18	49	3.18	2.72	1.5	185	220	10
3	1	40	1.49	1.82	1.0	135	220	45
3	2	25	1.17	0.92	0.7	135	220	45
3	3	20	1.15	0.74	0.5	135	220	20
3	4	20	1.02	0.17	0.7	135	220	15
3	5	9	1.04	0.62	0.8	135	220	15
3	6	0	2.17	2.29	1.7	180	220	15
3	7	0	3.26	4.32	2.7	180	220	15
3	8	0	4.22	4.29	3.2	180	220	30
3	9	0	4.18	3.96	3.7	180	220	30
3	10	0	1.08	0.82	0.9	135	220	20
4	1	18	0	0	0	135	220	10
4	2	9.3	0	0	0	135	220	10
4	3	0	0.72	0.54	±	135	220	15
4	4	0	0.91	0.53	±	135	220	15
4	5	0	0.64	0.32	±	135	220	15
4	6	0	0.82	0.95	±	135	220	15
4	7	0	1.43	1.37	0.9	135	220	15
4	8	0	2.94	2.82	1.2	180	220	15
4	9	0	4.42	3.30	1.9	180	220	15
4	10	0	4.70	3.94	3.0	180	220	15
5	1	50	0	0	0	135	220	45
5	2	8.2	0	0	0	135	220	45
5	3	5.4	±	±	±	135	220	45
5	4	4.3	0.72	0.53	±	135	220	15
5	5	0	0.64	0.42	±	135	220	15
5	6	0	0.85	0.36	±	135	220	15
5	7	0	1.74	1.82	0.7	150	220	15
5	8	0	3.34	3.47	2.7	190	220	45
5	9	0	4.32	2.70	3.5	190	220	45
5	10	0	5.68	3.12	4.2	190	220	75
5	11	0	1.74	1.62	0.9	150	220	75
5	12	0	0.72	0.14	±	135	220	75

* A trace is indicated by +, and a faint trace by ±.

Normal fatty acids which contain an odd number of carbon atoms cannot yield beta-oxybutyric acid.

The acetone bodies might readily be formed from proteins, by separation of the NH_2 group from the amino-acids.[5] It was formerly thought that they could be formed from carbohydrates, as is the closely related lactic acid, but we now know that this is not true.[6] It is to be remembered, therefore, that theoretically the acetone bodies may be formed at the expense of proteins or fats, but that usually they are formed from

TABLE 2.—COMPOSITION OF OX MEAT

	Per Cent.
Glycocoll	2.06
Alanin	3.72
Valin	0.81
Leucin	11.65
Prolin	5.82
Phenylalanin	3.15
Aspartic acid	4.51
Glutamic acid	15.49
Serin	?
Tyrosin	2.20
Arginin	7.47
Histidin	1.76
Lysin	7.59
Ammonia	1.07
Tryptophan	Present

the fats and in severe diabetes from the fatty acids produced by the deaminization of amino-acids.[7]

It has been asserted by several observers[8] that sugar produced from protein can inhibit the formation of acetone bodies just as well as carbohydrate can. This statement is based on the fact that with an increase of protein catabolism the acetonuria is lessened, if at the same time the protein given does not drive up the glucosuria and thus do away with the inhibitive action that the protein sugar would exert.[9] In health the catabolism of large quantities of protein can dissipate acidosis on account of its partial conversion into sugar, but in diabetes protein does not act so, as the sugar is not burned up.

Borchardt[10] found that protamin, histon, egg albumin, pancreas and casein, which contain monamino-acids, increasing in the order named, when given to healthy subjects, showing acidosis from carbohydrate starvation, produced different effects on the amount of the acetone bodies excreted. Protamin increased the acidosis, while casein reduced it. Rosenthal[11] found that when meat, casein, egg albumin or thymus were added to a high protein diet they all increased the acetonuria. He thought the higher the glycogen-producing quantity of the protein and its content of monamino-acids, the less is its ability to produce acetone. Lüthje[12] asserted that calf thymus reduced diabetic acidosis, while casein increased it. Labbé,[13] Cammidge,[14] von Noorden,[15] and Hugounenq and Morel[16] have all shown that a high protein feeding to diabetics has a ketogenic influence which in time may be of serious import. Moorhouse, Patterson and Stephanson[17] have recently shown that in experimental diabetes in dogs the course of the acetone excretion bears a close relation to the protein metabolism, and they think that the acetone excretion depends on the character of the proteins fed, as they found that when feeding erepton, the acetone excretion was high. On feeding caseinogen, the amount of acetone excreted fell, and on feeding gelatin the acetone was markedly diminished.

METHODS

The standard strict diets of von Noorden[18] were used in this work. The increased amount of protein added to the diet was always given as meat. The glucose was estimated by Benedict's[19] method, the acetone and diacetic acid by Folin's[20] method, and the beta-oxybutyric acid by Shaffer's[21] method.

EXPERIMENTAL

Table 1 presents the results obtained in this study. All of the five cases studied show a marked increase in the amounts of the acetone bodies excreted in the urine when the protein intake was increased; and when the protein intake was lowered, the amount of the acetone bodies excreted was lessened.

TABLE 3.—COMPOSITION OF GELATIN

	Per Cent.
Glycocoll	16.5
Alanin	0.8
Valin	1.0
Leucin	2.1
Isoleucin	..
Phenylalanin	0.4
Tyrosin	0
Serin	0.4
Cystin	..
Prolin	7.7
Oxyprolin	3.0
Aspartic acid	0.6
Glutamic acid	0.9
Tryptophan	0
Arginin	7.6
Lysin	2.8
Histidin	0.4
Ammonia	0.4

These results may also explain partially the remarkable effects of the so-called green days and oatmeal days in lessening the amount of acetone bodies excreted in the urine. As both of these diets contain very little protein (typical green days 30 gm., and typical oatmeal days 51 gm.), it may be that part of the lessened excretion of acetone bodies is due to the lowering of the protein intake.

It is most likely that the increased excretion of the acetone bodies produced by increasing the protein intake is due to the fact that some of the amino-acids present in the protein act as ketogenic substances. In Table 2 is given the most complete analysis of ox meat.[22]

It is well known that of these constituents the *leucin*, *tyrosin* and *phenylalanin* are ketogenic, and it may be that the increased excretion of the acetone bodies is due to the presence of these amino-acids in the increased amount of meat protein ingested.

5. Fittipaldi: Zentralbl. f. d. ges. Physiol. u. Path. d. Stoffwechs., 1901, v, 161. Emden and Engel: Beitr. z. chem. Phys. u. Path., 1907, xi, 323.
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8. Talma: Therap. d. Gegenw., 1901, p. 385. Hirschfeld: Ztschr. f. klin. Med., 1895, xxviii, 176. Waldvogel: Ibid., 1899, xxxviii, 506. Rosenfeld: Centralbl. f. inn. Med., 1895, No. 51.
9. Von Noorden: Metabolism and Practical Medicine, 1907, iii, 590.
10. Borchardt: Arch. f. exper. Path. u. Pharmakol., 1905, liii, 388.
11. Rosenthal: Centralbl. f. inn. Med., 1908, 185.
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13. Labbé: Semaine méd., 1911, p. 506.
14. Cammidge: Lancet, London, 1913, ii, 1319.
15. Von Noorden: Med. Klin., 1913, ix, 612.
16. Hugounenq and Morel: Semaine méd., 1911, p. 505.
17. Moorhouse, Patterson and Stephanson: Biochem. Jour., 1915, ix, 171.
18. Von Noorden: Die Zuckerkrankheit und ihre Behandlung, Berlin, 1912.
19. Benedict: Jour. Biol. Chem., 1911, ix, 57.
20. Folin: Jour. Biol. Chem., 1907, iii, 177.
21. Shaffer: Jour. Biol. Chem., 1908, v, 211. Shaffer and Marriott: Ibid., 1913, xvi, 265. Pribram: Ztschr. f. exper. Path. u. Therap., 1912, x, 279, 284. Cook and Gorslin: Jour. Biol. Chem., 1911, x, 291.
22. Osborne and Jones: Am. Jour. Physiol., 1909, xxiv, 438.

Another reason to suspect that this is the case may be found in the results obtained by Moorhouse, Patterson and Stephanson. They found that, of the various proteins studied in regard to their effect on the excretion of acetone in dogs rendered diabetic, gelatin produced a marked diminution in the excretion of these bodies. I think the explanation of this result is due to the fact that gelatin contains very small amounts of *leucin, tyrosin* and *phenylalanin,* as may be seen from the analysis[23] given in Table 3.

The importance of restricting the amount of protein in the diet in diabetes has long been well known in regard to the sugar excretion.[24] I present in this paper data showing the importance of restricting the protein intake in diabetes in relation to lessening the amount of excretion of the acetone bodies in the urine. It is possible that by selecting proteins free from those amino-acids that are ketogenic we may be better able to control the formation of the acetone bodies in this disease.

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THE PREVENTION AND TREATMENT OF RINGWORM AND FAVUS OF THE SCALP

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In a recent case report of "Two Favus Families,"[1] I illustrated some of the results of neglecting to attend properly to every case of favus of the scalp as soon as it is discovered.

Ringworm and favus of the scalp are not common diseases in many of our smaller cities and towns. The importance, therefore, of properly caring for the early cases, in order to prevent their spread, is often insufficiently appreciated by the health authorities and physicians of such localities.

In addition to this, the profusion of drugs recommended for these diseases, as well as the lack of detailed information of the method of carrying out the treatment and of what is expected from it, leave the physician, who is unfamiliar with these diseases, uncertain what to do.

As ringworm and favus are closely related, and as their treatment is similar, they may well be considered together. Both are children's diseases and preeminently diseases of the school age. Ringworm of the scalp heals spontaneously at the approach of puberty, and is almost never found in an adult. Favus almost always begins in childhood, but unlike ringworm, does not usually heal spontaneously until it has destroyed all the hair of the scalp, which frequently is not until late in life.

These diseases do not affect the general health, and their importance consists chiefly in the loss of education to the individuals affected, as the children are usually excluded from school. In the case of favus this exclusion generally includes the whole school life of the child, if he is not properly treated.

The objects to be sought in the management of these diseases are the prevention of their spreading to others and the cure of the affected individuals.

In order to prevent their spread:

1. All cases should be reported to the health authorities, who should have the power of supervising them. Diseases which are excluded from this country by the federal government are not too unimportant to be noticed when they are found here.

2. Whenever a case is discovered in a school, all the children in the room should be examined. This is more necessary in the case of ringworm than in that of favus, as it is much more contagious than the latter, which is usually contracted only by members of the immediate family.

3. Whenever a case is found, it should be ascertained whether there are other children in the family or house, and if there are, all these children should be examined, for it is the exception for only one child of a family to be affected in the case of ringworm, and in the case of favus more than one are frequently affected. This is easily understood, as both diseases are especially found in unhygienic and crowded quarters.

4. Houses in which cases have been found should be thoroughly disinfected after the disease is cured or when they are vacated.

Other precautions for the prevention of the spread of the diseases naturally come under the head of treatment and will be considered there.

The modern and only satisfactory rapid method of curing these diseases is by the use of the Roentgen ray, but as it can be employed only by a skilled roentgenologist who has had an opportunity of previously seeing its application, and as it is not practicable in localities in which there are only a few cases to be treated, it will be simply mentioned in this place.

Strickler[2] of Philadelphia recently reported good results in ringworm with a vaccine treatment, which will be of great value if further use confirms his results.

Before considering the treatment in detail, it will be well to consider some of the difficulties to be contended with. In the first place the fungi are extremely tenacious of life when removed from the scalp. Ringworm can ordinarily be produced from crusts which have been preserved for from three to six months, and instances of successful inoculation have been known to take place after eighteen months, though the spores are always dead after two years. The life of the fungus in the hair is longer, and spores in removed hairs will usually grow after fifteen or eighteen months. Favus spores have been found living in scutula after two years.

In locations in which they can be reached by antiseptics, the fungi are easily destroyed, but in both diseases a large number of the fungi are buried deeply in the hair follicles and in the interior of the hairs. When we consider the fact that in the case of ringworm "soaking the hair in absolute alcohol for as long as twelve hours will not inhibit the growth of the fungus," we are not surprised that "the resistance of the parasite in the hair follicle has up to the present time remained almost absolute to all chemical agents." This statement may be extended to include the Roentgen ray, which does not kill the parasites.

23. Fischer, Levene and Aders: Ztschr. f. physiol. Chem., 1902, xxxv, 70. Kossel and Kutscher: Ibid., 1901, xxxi, 165. Fischer and Boehner: Ibid., 1910, lxv, 118.
24. Kossel: Deutsch. med. Wchnschr., 1898, p. 58. Müller and Seegen: Ibid., 1899, p. 209. Stiles and Lusk: Am. Jour. Physiol., 1903, x, 380.

1. Lane, J. E.: Two Favus Families, THE JOURNAL A. M. A., Oct. 16, 1915, p. 1362.

2. Strickler, Albert: The Vaccine Treatment of Ringworm of the Scalp, THE JOURNAL A. M. A., July 17, 1915, p. 224.

From these facts is easily seen the futility of all treatment by antiseptics alone, in whatever form they may be used. They are necessary but, without the removal of the deep-seated fungi, they are unable to effect a cure of either disease. In this connection it may be well to quote Sabouraud,[3] to whom all who say anything about these diseases must acknowledge their indebtedness. He says that "the frequent observations of favus cured without depilation by various applications must assuredly be ranked as fables," and that "when an author claims to have cured a tinea tonsurans in three weeks, he evidently does not know what he is talking about, and the only reply that can be made is, that it takes at least six weeks to affirm that it is cured."

TREATMENT

1. The hair should be cut short over the whole head, but it should not be shaved, as this would prevent effectual depilation. This is essential in all cases of favus and in all cases of ringworm, except those of very limited extent. In these the hair must be cut well around the edges of the affected area. The purpose of this is cleanliness, prevention of the spread of the disease, easier discovery of new patches, and facilitation of the treatment.

2. When crusts are present they must be removed. This is best accomplished by soaking the head with oil for a day or two to soften them. Cottonseed oil, to which 1 per cent. of betanaphthol has been added, serves the purpose admirably. The head is then washed with an antiseptic soap for which the following formula may be used:

℞	Betanaphtholis	3 parts
	Sulphuris praecipitati	10 parts
	Saponis mollis q. s. ad	100 parts

3. Depilation is the most important as well as the most difficult and tedious part of the treatment, except when the Roentgen ray is used. The most satisfactory method of depilation is still that of the thumb forceps, although many easier and quicker methods have been tried. In extensive cases of favus, the whole head must be depilated and redepilated as fast as any hair grows, for at least three months. In early cases with small areas involved the depilation may be limited to the affected areas and a circumference of half an inch. In the case of ringworm, depilation of the patches cannot be completely accomplished, as many of the hairs are broken off and the rest are so fragile that they break when this is attempted. But all patches should be kept as completely depilated as possible, together with the surrounding area, as in the case of favus.

4. The value of antiseptic applications lies in the destruction of the superficial fungi and in preventing the spread to other spots and to other individuals. They also serve the additional purpose, in the case of ringworm, of irritating and causing some inflammation in the affected areas, which facilitates the expulsion of the stumps of the broken hairs that cannot be pulled out. The affected areas are painted daily with:

℞	Tincturae iodi	20 parts
	Alcoholis	80 parts

and the following ointment applied to the whole head:

℞	Hydrargyri praecipitati flavi	1 part
	Sulphuris praecipitati	1 part
	Resorcinol	1 part
	Olei cadini	10 parts
	Adipis lanae	10 parts
	Petrolati	10 parts

5. The head should be washed daily or every other day with the antiseptic soap for which the formula has been given. If crusts persist in forming they are softened and removed as often as necessary.

6. The following additional precautions should be taken: It is hardly necessary to say that individual toilet articles should be used. Keeping the hair cut short removes any necessity for the use of comb and brush. Affected children should sleep alone. Other children should not be allowed to wear the hats of the patients. The heads should be isolated as well as possible, and for this purpose there is nothing better than a tight-fitting cotton cap which can be boiled or thrown away when soiled. The scalps of persons affected with these diseases bear irritation remarkably well, and there is usually no occasion for interrupting the treatment. However, if the heads become sore from it, it is stopped for a few days, and petrolatum applied till it is resumed.

If these steps are carried out faithfully for a long enough period of time, the diseases will be cured and their spread pretty well limited. In extensive cases, the time necessary for cure is not likely to be less than two years, except in some of the rarer varieties of ringworm. When a case after vigorous treatment is apparently cured, treatment should be suspended for a month or six weeks. If there are no signs of recurrence at the end of that time, the patient should be examined occasionally for another six weeks before he is pronounced cured. If, in the meantime, any unhealed spots become visible, treatment should be at once resumed.

This is not an easy way to cure these diseases, but the more thoroughly it is realized that, with the exception of the Roentgen ray, there is no easy way of curing them, the better shall we take the precautions necessary for preventing their becoming so numerous as to present a serious problem.

The applications mentioned are no better and no more efficient than many others. They may be varied ad libitum with perfect confidence that many others are just as efficient in keeping the surface clean, and just as inefficient for affecting the disease in the hair follicles.

The difficulties encountered in the treatment of ringworm have been well stated by Martin[4] as follows:

1. The multiplicity of treatments proposed.
2. The confusion in the diagnosis of the different varieties.
3. The certainty of an ultimate spontaneous cure.
4. The depth of the anatomic seat of the lesion.
5. The difficulty of diagnosis, especially of an early diagnosis.
6. The difficulty of diagnosis of cure.
7. The difficulties of prophylaxis.

All of these difficulties are considerable in the case of ringworm, and for the most part equally so in the case of favus.

I have avoided adding to the confusion by mentioning any new drugs or combination of drugs that are still constantly being suggested with claims for the remarkable results referred to by Sabouraud as "fables." A few of the statements made here are not strictly applicable to some of the rarer varieties of ringworm, but it seemed best not to complicate the subject by calling attention to exceptional cases.

3. Sabouraud: Les teignes, Paris, 1910.

4. Martin, quoted by Sabouraud: Les teignes, p. 758.

NEPHRITIS

A NEW SERIES OF CASES WITH A REVIEW OF RECENT LITERATURE *

W. OPHÜLS, M.D.
SAN FRANCISCO

RESULT OF AUTHOR'S INVESTIGATION

The material for this investigation has been collected since the reading of my first paper. On the whole the method of investigation and the class of cases covered has been the same, but in this instance the anatomic research has been supplemented by a careful study of the clinical histories.

The material comprises eight cases of amyloid disease associated with chronic parenchymatous nephritis, thirty-four cases of general arteriosclerosis with cardiac hypertrophy, in which the kidneys were slightly involved in twelve and moderately diseased in twenty-two cases. In addition there were eight cases of general arteriosclerosis with more extensive renal lesions of the type described in my first paper as arteriosclerotic nephritis. The most interesting group was that of thirty-two cases of glomerulonephritis of which four were acute, eight subacute, seventeen chronic; in addition, belonging to the last group, there were three cases in children which it was difficult to classify on account of the peculiar mixture of subacute and chronic lesions in them.

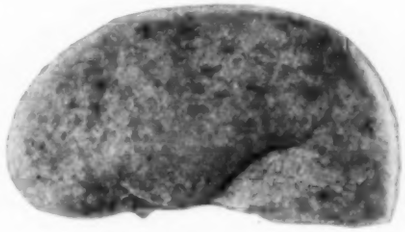

Fig. 1.—Case XVII, 188, acute glomerulonephritis; one-half normal size.

SUBACUTE AND CHRONIC PARENCHYMATOUS NEPHRITIS

These cases certainly, of themselves, form a separate group, both anatomically and clinically. They represent the "nephroses" of Volhard and Fahr.[4] Their most characteristic feature, histologically, is the extensive epithelial degeneration with granular change and development of double refractile lipoid droplets. The diseased tubules are usually full of casts. Amyloid was found again in all my cases, although in some the amount of amyloid in the glomeruli was not very large. In all cases amyloid was also found in the spleen or liver or both. The etiologic factors in all of them were the usual causes of amyloid disease (chronic tuberculosis in three, chronic syphilis in one, malignant tumor in one, chronic suppuration in three).

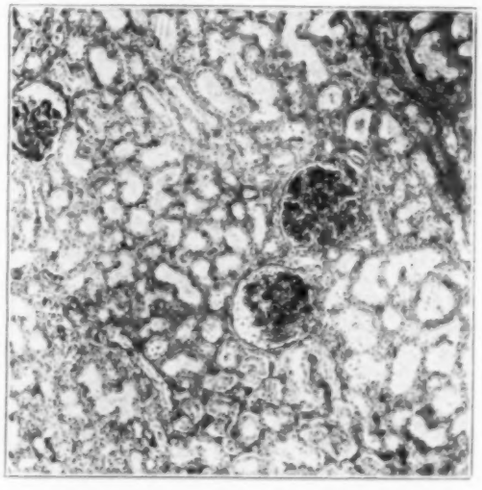

Fig. 2.—Case XVIII, 158, acute glomerulonephritis; magnified 57 times.

From the very beginning, as emphasized in my previous paper, these cases show inflammatory lesions in and about the glomeruli. In the early stages there may even be a very heavy infiltration of the glomeruli and of the interstitial tissue with polymorphonuclear leukocytes. Connective tissue proliferation sets in early and eventually may lead to considerable shrinkage of the kidneys, which at first are very large and white. On account of these inflammatory changes, the occurrence of which in the later stages is acknowledged by Volhard and Fahr, I believe that their appellation "nephrosis" is faulty and I still prefer the term acute, subacute or chronic parenchymatous nephritis with, or possibly without, amyloid.[5]

Clinically these cases are characterized by very pronounced urinary findings (much albumin, many casts), marked edema (although very emaciated cases may remain "dry"), absence of hypertension and a small heart.

GLOMERULONEPHRITIS

1. Acute glomerulonephritis: Figure 1 shows a characteristic gross specimen of this condition and Figure 2 is a photomicrograph taken in a typical case. The kidneys in these cases are usually considerably swollen, hyperemic, edematous, somewhat opaque.

Petechial hemorrhages are frequently found in the cortex, but they vary considerably in number. The best descriptive term to apply to these kidneys is large variegated kidney, because their discoloration contrasts strongly with the extreme pallor of the amyloid kidneys (large white kidney).

The histologic features of the process are acute inflammatory lesions in and about the glomeruli, inflammatory hyperemia, and edema of the interstitial tissue, blood, leukocytes and casts in the tubules. The epithelium is more or less degenerated. The presence of numerous neutrophilic and of some eosinophilic leukocytes in the affected glomeruli and in the tissues plainly show the inflammatory character of the condition.

The urinary findings are very pronounced; there may be edema. Blood vessels and heart are still normal except for accidental lesions.

The condition is caused by septic infection, usually with streptococci, and the death of the patient is due to the overwhelming infection, the nephritis playing a minor part in the clinical symptom-complex.

Even at this early stage a certain degree of anemia may have developed on account of the underlying septic infection.

In three of our cases the acute *diffuse* glomerulonephritis was the result of a final exacerbation of a chronic diplostreptococcus endocarditis.

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* From the Pathological Laboratory of the Leland Stanford Junior University, School of Medicine.

* Read before the Section on Pathology and Physiology at the Sixty-Sixth Annual Session of the American Medical Association, San Francisco, June, 1915.

* Because of lack of space the review of the literature has been omitted in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on request.

4. Volhard and Fahr: Die Brightsche Nieren-Krankheiten, Berlin, 1914.

5. In this consideration I have eliminated the purely toxic forms of nephritis like the corrosive sublimate kidney, etc., on account of lack of suitable material.

2. Subacute glomerulonephritis: In these cases the kidneys are also large, more or less opaque and variegated. Some of them are studded with minute hemorrhages (Fig. 3) others are more pale as in Figure 1. Histologically the glomeruli show hyaline necroses of some of their loops, intracapillary and extracapillary proliferation (Fig. 4). The tubules are in the same condition as in the acute cases. The infiltration of the interstitial tissue with neutrophilic and eosinophilic leukocytes is often very severe and there are evidences of a beginning diffuse proliferation of the connective tissue. The blood vessels locally and generally are still normal except in the late cases, when a local involvement of the blood vessels may be noticed. The blood pressure rises gradually to 180 to 200 and there may be seen at necropsy a commencing hypertrophy of the left ventricle.

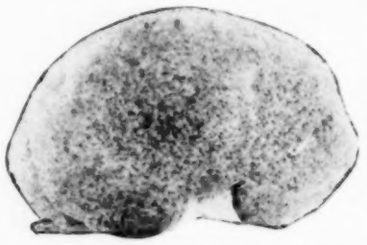

Fig. 3. — Case XVIII, 166, subacute glomerulonephritis; one-half normal size.

The urinary findings are very marked and in one of our late cases there was evidence of a beginning polyuria. The anemia is also more noticeable.

The etiology in all cases is very evident in a comparatively recent history of tonsillitis, rheumatism and other forms of streptococcus infection with or without endocarditis. The latter was present in four of our eight cases. One of our cases, a very pronounced diffuse subacute glomerulonephritis in a baby of 2 months, was remarkable on account of the absence of streptococcus infection. In this case the lesion must be attributed either to a severe colon bacillus pyelitis or possibly to congenital syphilis, of which there was definite clinical and anatomic evidence.

Edema is often marked, but is not always present. One late patient in whom the condition had been running for about six years had an albuminuric retinitis and died in uremic coma. Most of the patients, however, died within one year of the infection, but there were three late patients who lived thirteen months, four years and six years, respectively. In several of these late subacute cases the symptoms of the original infection had more or less subsided and the symptom-complex was dominated by the nephritis.[6]

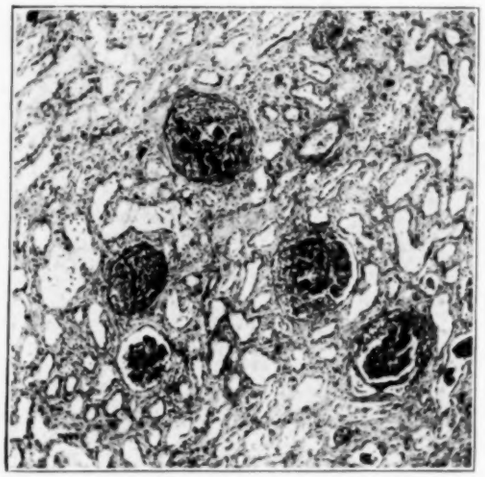

Fig. 4.—Case XIV, 34, subacute glomerulonephritis; magnified 57 times.

In both acute and subacute cases diplostreptococci can often be found in the urine.

3. Chronic glomerulonephritis: In chronic glomerulonephritis the kidneys show marked evidence of contraction which is either diffuse, and then the surface of the organ remains smooth (Fig. 5), or irregular, producing a granular (Fig. 6), or sometimes even coarsely nodular, surface. The capsule is thickened and adherent. The color varies from dark red with numerous hemorrhages to a pale putty color. Quite often one notices a distinct brownish tinge on account of hematogenous pigmentation of the epithelium and other tissues. Some of the kidneys are more or less cystic. The cortex is narrow and the markings on the cut surface are indistinct.

The microscope (Fig. 7) shows a marked diffuse proliferation and fibrous transformation of the connective tissue with atrophy of many tubules. Other tubules may remain large or even become hypertrophic. Many of them still contain leukocytes and red blood corpuscles. There may be much epithelial degeneration and many casts. The glomeruli become more and more fibrous and eventually are transformed into small solid nodules of hyaline connective tissue. Even at this stage, however, one usually encounters at first many, later few, glomeruli with subacute lesions; which finding materially assists in the histologic diagnosis.

The blood vessels in the kidney show most remarkable differences. In some very old and far-advanced cases they remain practically normal, in others they show intense lesions very early. These vascular lesions develop into extreme degrees of endarteritis both in the small and in the larger arteries. The disease of the blood vessels remains localized in the kidneys and the renal arteries in the majority of cases (ten in our series of fifteen with marked vascular lesions) but there are some in which a very pronounced degree of general arteriosclerosis develops eventually.

The blood pressure is always elevated and runs up to 200, more rarely to 250. The heart is usually enlarged, but within moderate limits. The wall of the left ventricle, however, may show a very evident concentric hypertrophy. There were three cases with normal or even small hearts.

The urine continues to show considerable albumin, more or less constantly. Casts may be present at all times or in showers. Red blood corpuscles and leukocytes are found frequently. Practically all our cases showed a marked polyuria and some definite hyposthenuria. The phenolphthalein excretion when measured was always found considerably diminished and sometimes almost entirely suppressed.

Edema is a very common symptom, but there are "dry" cases. Uremia is often observed (eleven cases out of seventeen); retinitis albuminurica more rarely (three out of seventeen).

Anemia, with very few exceptions, is well developed; it being very common to see a reduction of red blood corpuscles and hemoglobin to one half or less. The character of the anemia is that of a severe secondary anemia.

It is natural, that in these old cases it is much more difficult to detect the original infection which caused

6. Volhard and Fahr distinguish between a more severe form of subacute glomerulonephritis with much extracapillary proliferation in the glomeruli and a milder form with intracapillary lesions only. I believe this is an unnecessary refinement, but there is no question that the cases with much extracapillary proliferation are the severer ones.

the nephritis, unless it persists palpably in the form of an old endocarditis or, as in one of our cases, in the shape of an old septic infarct of the spleen, full of influenza bacilli. A careful study of the clinical record, however, usually reveals a very definite history of repeated attacks of tonsillitis, rheumatism or other septic troubles, and it is suggestive that the better the record the more commonly is there note of such conditions. In some cases it may be possible to discover the old septic focus at necropsy, although this may not always be an easy matter. In some cases the urinary tract itself may afford a hiding place for the streptococci, they being found more or less constantly in the urine, and at necropsy in smears from the slightly inflamed renal pelvis or urinary bladder. The more intensive study of this series of cases has greatly strengthened my previous conviction that all these cases are due to septic and mostly streptococcic infections in the last resort, and also the idea that it is the continuance of this infection in more or less hidden foci which keeps the process in the kidneys going.

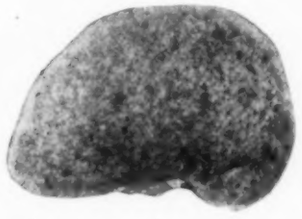

Fig. 5.—Case XVI, 10, chronic glomerulonephritis; diffuse contraction with smooth surface; one-half normal size.

4. Subacute and chronic glomerulonephritis in children: This small separate group of three cases of glomerulonephritis in children is especially interesting for several reasons. The etiology was very evident in all three cases, in one a general diplostreptococcus sepsis with an infectious aneurysm of the abdominal aorta without history of tonsillitis, in another repeated attacks of tonsillitis and in the third, a boy of 6 years, nephrolithiasis with development of a large calculus in the bladder and streptococcus infection of the urinary tract.

The rise of blood pressure in these three cases was well marked (about 150) and the cardiac hypertrophy very definite, in fact, more pronounced than in adults, as one would expect in the youthful organism. This in the absence of all signs of general arteriosclerosis and in one case of all local vascular change in the kidneys definitely proves that the hypertension in nephritis is not the result of arteriosclerosis. In two cases there was very marked local arteriosclerosis in the diseased kidneys without any further involvement of the arteries elsewhere, proving also that the arteriosclerosis in the kidneys in these cases is purely the result of local conditions.

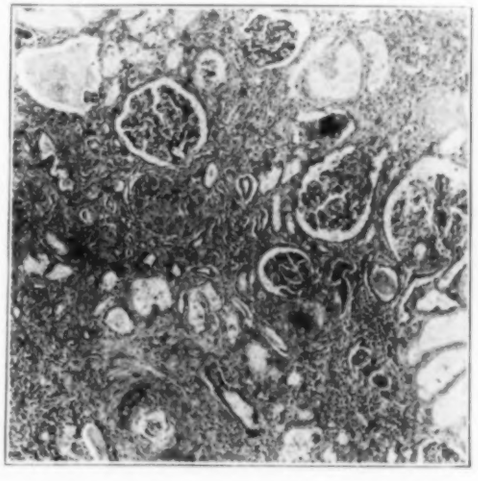

Fig. 7.—Case XVIII, 19, chronic glomerulonephritis; magnified 57 times.

5. Focal hemorrhagic glomerulonephritis (Löhlein): In subacute or chronic bacterial endocarditis, Löhlein[7] has described glomerular lesions which he believes to be essentially different from those in true glomerulonephritis. Baehr,[8] who studied the kidneys in twenty-five cases of bacterial endocarditis, found this condition in twenty-three of them and gave a very complete description of the process. The characteristic feature appears to be a hyaline necrosis of a circumscribed portion of a certain number of glomeruli, associated with hemorrhage. The hyaline material is later organized and replaced by fibrous tissue. Löhlein suggested that the condition might be of embolic origin, due to the detachment of very small pieces of septic thrombus from the heart valves, but he was unable to find any bacteria in the hyaline material which fills the capillaries of the glomeruli in these cases. Since then Baehr has actually demonstrated the diplostreptococci in the affected loops in five of his more acute cases, in specimens that were fixed in alcohol. The bacteria, however, seem to disappear very rapidly in the lesions; as Baehr says: "In the later stages of the lesions, bacteria were never found; apparently they underwent destruction during the early stages when the glomerular structure was disintegrating." Inflammatory lesions in and about the affected glomeruli are usually absent or much less intense than in ordinary glomerulonephritis, but when the condition involves the major part of a glomerulus and is associated with a more intense reaction, as sometimes happens, it is difficult to distinguish it from true glomerulonephritis. The focal character of the disease also varies a good deal in different cases, sometimes a few glomeruli being affected, at other times a great many. If a great many glomeruli are involved rather severely, it becomes difficult to distinguish this form from diffuse glomerulonephritis both histologically and clinically, and I believe, in the descriptions laid down in literature, one can find all intermediate stages between focal and true diffuse glomerulonephritis. The differences are purely quantitative in character and I cannot help but feel that this focal hemorrhagic glomerulonephritis is merely an abortive form of true glomerulonephritis.[9] The knowledge of the frequent occurrence of this type of disease in subacute and chronic endocarditis is of considerable practical importance, as it will prevent the clinicians from diagnosing a serious diffuse glomerulonephritis merely on the basis of possibly transitory urinary findings.

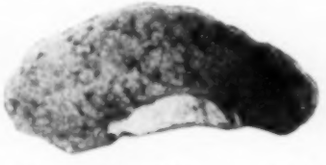

Fig. 6.—Case XVII, 68, chronic glomerulonephritis; granular contracted kidney; one-half normal size.

7. Löhlein: Pathologische Anatomie der haematogenen Nephritis, Ergebn. d. allg. Path. u. path. Anat. (Lubarsch und Ostertag), 1910, xiv, No. 2, p. 874.

8. Baehr: Glomerular Lesions in Subacute Bacterial Endocarditis, Jour. Exper. Med., 1912, xv, 330.

9. Löhlein's statement that in true diffuse glomerulonephritis *all* glomeruli must show evidence of disease, is certainly an exaggeration. The lesions usually affect a majority of the glomeruli, but all subacute and chronic cases show clear evidence of a more gradual involvement of glomeruli, apparently in repeated crops.

Cases of this kind have been found not only in diplostreptococcus endocarditis but also in ordinary streptococcus infections and even in colon bacillus sepsis.

It is interesting to note that in the three acute cases of diffuse glomerulonephritis of our series which were the result of chronic diplostreptococcus endocarditis, old focal lesions of the character just described were found in all. Evidently in these cases, for a considerable time, the kidneys were involved to a minor degree only, until a sudden recrudescence lighted up the process and caused more acute *diffuse* lesions and incidentally the death of the individual.

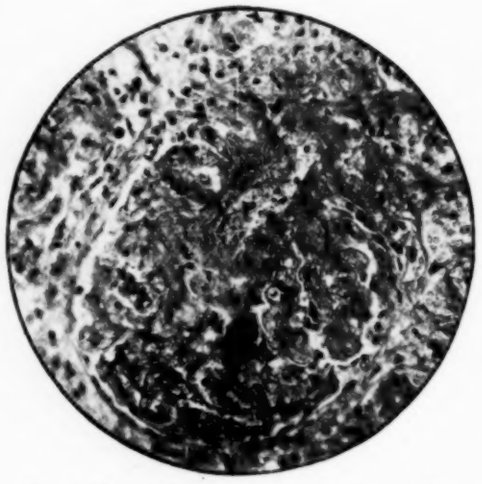

Fig. 8.—Case XVI, 212, hyaline deposit and degeneration extending beyond glomerulus along vas afferens; magnified 210 times.

6. Histogenesis of glomerulonephritis: There remain to be discussed a few problems connected with the histogenesis of glomerulonephritis. There are especially two important questions which arise naturally: first, How are the so important lesions produced in the glomeruli? Second, Is there any explanation for the later involvement of the blood vessels?

As stated before, Löhlein had postulated an embolic origin for the lesions observed in focal glomerulonephritis, and his deductions seem to have been confirmed by the actual finding of bacteria in the early stages of the condition both by Baehr[5] and by Fahr.[6] I do not see any reason why this idea could not be extended to all cases of glomerulonephritis or at least to the majority of them. In practically all my cases during the more acute stages, some and often many loops of the affected glomeruli are more or less completely filled with peculiar hyaline masses[10] which have been described by many previous investigators, and the wall of these capillaries undergoes a peculiar form of hyaline necrosis with karyorrhexis of the nuclei of the endothelium and other cells. The origin and meaning of this peculiar form of thrombosis has been the source of much discussion. From a study of the early cases I have become convinced that this thrombosis and subsequent hyaline necrosis of the capillary wall precedes all other changes in the glomeruli, which is in full agreement with the opinion of previous investigators. The only difficulty in the way of assuming an infectious, embolic origin for these lesions is the fact, which I can confirm from my own experience, that in spite of the most careful search one cannot find any bacteria in these masses. The detection of isolated bacteria is, however, made somewhat difficult by the numerous small fragments of chromatin scattered through the hyaline material. Still, in the embolic focal glomerulonephritis we encounter the same difficulty and the assumption is made, and I believe justly, that in the majority of instances it is the rapid destruction of the bacteria which accounts for their absence.

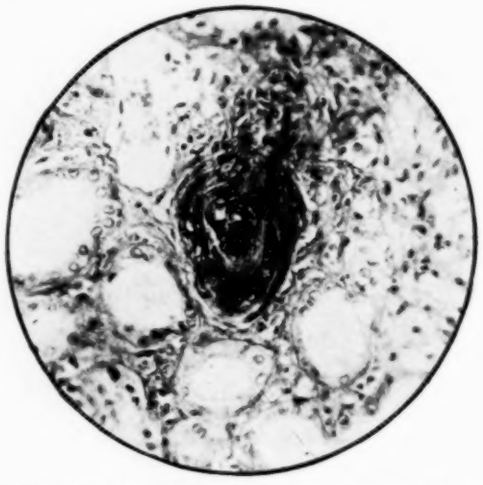

Fig. 9.—Case XVIII, 70, hyaline thrombosis of a small artery with complete obstruction; magnified 210 times.

When one considers in addition that in these cases of chronic septicemia, especially when they are associated with endocarditis, small clusters of bacteria necessarily must be in the circulation all the time, the mere fact that they cannot be found in the glomeruli is, to my mind, a strong argument for the belief that they must be destroyed in them because similar material in other cases is so apt to be found lodged in these structures. This line of reasoning suggests itself especially in those cases in which bacteria can be demonstrated easily in other capillaries of the same kidney but not in the glomeruli. Among my series there are several such cases in which many of the ordinary capillaries are full of diplostreptococci, but in which the diseased glomeruli are free from them.

In view of the actual finding of the bacteria in focal glomerulonephritis in which the reaction is less intense, I believe that we are justified in developing the following hypothesis: In cases of chronic septicemia the endothelium of the glomeruli gradually acquires strong bacteriolytic properties. When in such cases suddenly large numbers of the bacteria are thrown into the glomeruli, an explosive bacteriolysis takes place which liberates large amounts of bacterial toxins. These cause blood destruction resulting in hyaline thrombosis, hyaline necrosis of the wall of the capillaries and the inflammatory reaction about them.[11]

This theory, if true, would solve many difficulties which we otherwise encounter in an attempted explanation of the renal lesions. If we believe that the affection of the kidneys is purely toxic, it is difficult to understand how the poisons could ever become so concentrated in the blood that they would produce these intensely inflammatory conditions in the kidney, and in no other organs, but even more difficult to explain in case of a general intoxication would be the fact that all glomeruli are not affected similarly and simultaneously.

10. I wish to state here positively that these masses have nothing whatever to do with amyloid, as I was misled to assume in my previous paper.

11. An experimental confirmation of this idea is at present being attempted in our laboratory.

The relation of the disease of the small arteries to the rest of the renal lesions has also been the subject of much contention. It is evident from our specimens that the endarteritis cannot be the direct result of the inflammatory changes in the tissues about them, because, in some cases, the arterial lesions are early and extensive, in others the inflammatory changes in the connective tissue may be far advanced and the arteries remain practically normal. The great question here, as in other forms of arteriosclerosis, has always been whether the condition was due to toxic or to mechanical causes.

The careful study of some of my cases suggests what I believe to be a new and better solution of this question, so far as the arterioles are concerned. It brings the lesions in them into close connection with those in the glomeruli. The occurrence of peculiar hyaline masses in the wall of the diseased arterioles in chronic nephritis has been emphasized by several previous investigators. These hyaline masses were especially well marked in one of my cases (XVI, 212) of early chronic glomerulonephritis, and in this instance the relation of the arterial lesion to that in the glomeruli was especially evident. Many of the glomeruli were the seat of a very extensive hyaline necrosis which involved the vasa afferentia at their point of junction with the tuft, but differently from what one sees in the loops of the tufts—the hyaline material in the small arteries did not occlude the lumen entirely, but left a small open space in the center as shown in Figure 8, and could be followed back in the wall of the artery for quite a distance.

Fig. 10.—Case XVIII, 61, thrombotic masses containing leukocytes and red blood corpuscles underneath endothelium in small artery; magnified 210 times.

Sometimes the lumen of the arterioles is entirely closed by this process, as shown in Figure 9; most commonly, however, a small central lumen remains open. This lumen is either merely spared out of the heavy masses of hyaline fibrin deposited on the wall, or in many cases a more or less perfect layer of endothelial cells can be demonstrated on the inner surface of the fibrin. In some way the coagulable material must get in behind the endothelium. That this material is really derived from the contents of the blood vessels is shown by the fact that blood corpuscles, white and red, are carried behind the endothelium, as shown in Figure 10, in which several groups of red blood corpuscles are seen between the endothelium and the inner elastic layer. The same idea is borne out by the fact that the material which transudes into the tubules from the glomeruli partly coagulates in the form of ordinary fibrin, partly in the form of similar hyaline masses as shown in Figure 11.

Fig. 11.—Case XVIII, 70, fibrin both thready and hyaline in tubule; magnified 210 times.

This hyaline material in the arteries is gradually organized (Fig. 12) and eventually it is entirely replaced by fibrous tissue in which gradually elastic fibers develop as is clearly shown in Figure 13. The process, then, in the arterioles in this and in several other cases of my series, is evidently the result of the organization of a hyaline material furnished by a peculiar form of lateral thrombosis, and I imagine that such must be the case in other instances.

So far I have not been able to collect any data in explanation of the gradual extension of the disease from the arterioles to the larger arteries. That similar thrombotic processes in small and even large arteries are not uncommon in cases of chronic glomerulonephritis is evident in several of my cases.

In some of them, scattered small anemic necroses in the kidneys are shown; in others, anemic necroses and later scars in the heart muscle. These lesions in the heart muscle may give rise to clinical symptoms of myocarditis.

In one case (XVIII, 61) in addition to these myocardial changes there was clinical evidence of similar disturbances in the arteries of the brain (hemiplegia) and in the arteries of one leg (dry gangrene of the foot). Unfortunately we were not permitted to determine the exact condition at the necropsy.

PRIMARY ARTERIOSCLEROTIC CONTRACTED KIDNEY

I may be very brief on this point, as my subsequent experience entirely confirms the result of my previous observations. In these cases the general arteriosclerosis is the principal feature. The renal disease is more or less incidental and varies in intensity, anatomically, almost independently of the clinical conditions, although naturally an extreme involvement of the kidneys will aggravate the clinical symptoms.

The clinical signs are those of hypertension and of secondary circulatory disturbances. The urinary findings are comparatively slight and transient and the patients have no "kidney" history. There is little or no anemia. The development is insidious and the disturbances usually set in with cardiac distress and edema. None of my cases showed any definite uremic symptoms, although, of course, if the destruction of the kidneys is unusually extensive uremia might supervene. The etiology is entirely obscure.

These are the cases which show very high blood pressure and extreme cardiac hypertrophy; nevertheless, it must be emphasized again that there is by no means any direct correlation between the extent of the lesions in the arteries anatomically, the severity of the clinical symptoms and the amount of circulatory disturbance developing eventually.

Very interesting to me were two cases in women, in whom long-continued hypertension of 200 and more had been observed for years and still there was no cardiac hypertrophy detectable at necropsy.

COMBINATION FORM (VOLHARD AND FAHR)

I have reserved to the last a short discussion of the important problem whether, from an anatomic standpoint, there is any justification for the establishment of an additional group of cases of nephritis which would correspond to the combination form of Volhard and Fahr. It is the conception of these authors that there is a definite group of cases which develop primarily insidiously on an arteriosclerotic basis, but which eventually develop signs, both anatomically and clinically, of true nephritis. These cases, however, as Volhard emphasizes, from the beginning show a more rapid progress and a more malignant development than the ordinary cases of arterial hypertension. This fact alone would suggest that, from the very beginning, they cannot be entirely identical with them; in other words, that they do not commence as cases of uncomplicated arteriosclerosis.

The difficulty, of course, resides in the fact that in these more chronic cases which come to necropsy, when the destruction of the renal tissue is practically complete and all acute lesions have subsided, it is very difficult to decide in which way the process actually developed, whether on an arteriosclerotic basis or as an unusually chronic form of glomerulonephritis with extensive arterial involvement.[12]

In fact, it has been claimed again and again by eminent authority, that such a distinction eventually becomes impossible as it would be impossible, for instance, in a burnt-out building to find out how the fire originated. Among my series naturally there were several such puzzling cases and it was not until after repeated effort and considerable hesitation that they were eventually placed in one or the other category. I may say here that the segregation was made always on anatomic grounds without regard to the clinical history.

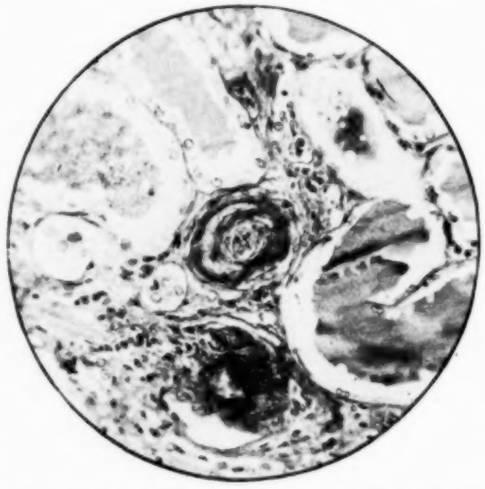

Fig. 12.—Case XVIII, 70, lateral hyaline thrombotic deposit in small artery in process of organization; magnified 210 times.

In some of these cases I was at first misled by the belief that the structure of the fibrous remnants of the glomeruli afforded some clue as to the nature of their mode of destruction, in this way, that in arteriosclerosis the glomerulus itself merely collapsed and became necrotic, which process was followed by a more or less crescentic fibrous thickening of the capsule; whereas in glomerulonephritis, on account of the more diffuse connective tissue proliferation, a much less definitely defined, diffusely fibrous nodule resulted, in which there often might be seen remnants of the original hyaline material. This is certainly true in the majority of cases, but I eventually recognized that this is by no means a reliable guide. My mind was first disabused of the correctness of this assumption by a study of a case (XV, 120) in which in spite of the fact that in a child of 6 a general arteriosclerosis was very unlikely and was actually absent, the glomeruli in the old lesions showed the "arteriosclerotic" picture. It became clear to me that when the glomerulonephritis is largely capsular, eventually a picture is produced exactly like that in arteriosclerosis. Having once clearly recognized this fact it became much easier to place the cases, and subsequent study only helped to confirm my growing belief that all cases in which one could detect definite inflammatory lesions in the glomeruli, even in a few of them only, belonged from the beginning in the group of glomerulonephritis.[13]

Fig. 13.—Case XVIII, 70, thrombotic deposits in small artery, completely organized. Beginning formation of elastic fibers; magnified 210 times.

In these cases the finding of granular leukocytes, especially eosinophils in the interstitial tissue, the presence of neutrophilic leukocytes in the tubules, the occasional hemorrhages, the nature of the changes in the arterioles, the sometimes apparent etiology, all pointed in the same direction, and also the fact that once included in the series of chronic glomerulonephritis, it became impossible to sift them out again by repeated reviews of this series.

The fact that in this way all cases showing severe renal symptoms eventually became included in this

12. How little one can depend in making this distinction on the points of difference laid down by Jores between true arteriosclerosis and endarteritis is shown in very many of my specimens. In one and the same section some of the arteries may show the picture of "endarteritis" and others of true "arteriosclerosis" according to Jores' definition, and it is very evident, from a careful study of such specimens, that the age of the lesion has much more to do with the histologic appearances than the nature of it. The older the lesions the more the picture of Jores' true arteriosclerosis is approximated.

13. A careful review of the specimens on which I based my first paper has convinced me that in the group of arteriosclerotic nephritis in this publication there are a few cases which I now would classify as chronic glomerulonephritis. The same is true of several of the cases reported in Gaskell's paper.

class and none which had a cardiovascular history may also be looked on as corroborative of the correctness of the classification.

Whether it will appear advisable, on the basis of more elaborate clinical observation, to subdivide the cases in this group of chronic diffuse glomerulonephritis into two subdivisions, a more acute and a more chronic one, is, of course, another question beyond the reach of my experience. I can only emphasize that from an etiologic and anatomic point of view such a subdivision, at present, appears uncalled for.

In conclusion I wish to emphasize that I do not look on acute, subacute and chronic glomerulonephritis as different stages in development but as different forms of the same disease.

The following is a brief summary of my findings:

1. Nephritis from an anatomic point of view may be best subdivided into: *a*, acute, subacute and chronic *parenchymatous nephritis* which is very frequently associated with amyloid; *b*, acute, subacute and chronic *glomerulonephritis* to which class belong most of the cases with continued definite urinary findings, renal hypertension, uremia and other definite symptoms of renal disease.

2. Hypertonic cardiovascular disease may involve the kidneys more or less extensively, often causes certain functional disturbances in the kidneys, may cause contracted kidney, but should be segregated entirely from true nephritis.

3. The cause of true nephritis is continued bacterial septicemia, and the lesions in the kidneys are probably due to rapid bacteriolysis and incidental liberation of large doses of toxic material in and about the affected glomeruli.

4. The lesions in the arterioles, in at least some of the more chronic cases, are due to the organization of a hyaline (thrombotic?) deposit on the inner surface of the arteries which at times is found underneath the endothelium.

ABSTRACT OF DISCUSSION

Dr. Joseph Von Werthern, San Francisco: I would like to ask Dr. Ophüls if there is any danger in the use of vaccines of having a disastrous effect on the kidney from the introduction of a large amount of such preparations at various times?

Dr. Lawrence Selling, Portland, Ore.: May I ask Dr. Ophüls' opinion on the combination form of Volhard and Fahr?

Dr. William Ophüls, San Francisco: So far as the vaccine is concerned, I really could not answer that question. I have no data on which to base any answer. So far as the combination form of Volhard and Fahr is concerned, it is discussed in my paper, which I abstracted, and I may say that I believe that the cases which they classify as the "combination form" are true cases of nephritis of a particularly slow and insidious type, and that on this account the clinical picture resembles more that of the cardiovascular cases. In these very chronic cases, if you have a good clinical history, you will often find evidence of a preceding infection, sometimes as long as twenty or twenty-five years. Frequently clinical evidence of such infection has recurred at intervals, and when you study the cases histologically, carefully, you find very convincing proof of *old* inflammatory lesions in the kidneys. I may say that I hesitated quite a little in some cases, whether I should classify them under the arteriosclerotic group, or within the inflammatory group. But after I had once made up my mind to put these cases into the inflammatory group, I could not get them out any more. I mean to say that I have gone over the chronic cases of the inflammatory group at least half a dozen times, trying to find cases that could be separated from the rest of them, but it was absolutely impossible. I was perfectly willing to follow Volhard and establish a combination form, but in my series it did not seem to work out that way.

RAYNAUD'S DISEASE

REPORT OF A CASE OF SYMMETRICAL GANGRENE OF UNUSUAL SEVERITY

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Whether the condition known as Raynaud's disease is to be considered of rather frequent occurrence or whether it is to be regarded as an extremely rare affection must necessarily depend on one's conception of this disorder. That many cases have been reported in which the diagnosis rests on an unstable foundation, there is no doubt.

Raynaud,[1] in his famous essay, makes three classifications of the disease which bears his name. He states there may be merely local syncope which usually has a brief existence though it is likely to be recurrent; (2) there may be local asphyxia which is not necessarily preceded by local syncope or (3) there may be symmetrical gangrene. Any one of these conditions of the extremities may occur without being followed or preceded by one of the others.

In local syncope the fingers or toes—more frequently the former—become blanched, presenting a white, waxy, swollen appearance. There is a sensation of burning or tingling in the parts affected and pain even may be extremely severe. This type is practically identical with the condition sometimes found in chilblains and is not infrequently described as "dead fingers."

The second stage, or local asphyxia, appears to be a severer degree of the same pathologic condition, but, as the name implies, the parts assume a cyanotic aspect. As a rule the skin first becomes a reddish purple and then it may return to normal or continue to darken until a blue-black color is attained. As in the first stages, pain may be troublesome and hot applications may afford relief.

The third stage, symmetrical gangrene, is the one with which this paper is chiefly concerned. And in order to put a check on the reporting of miscellaneous conditions as Raynaud's disease, it might be advisable to limit that title to this particular type. In this connection I quote Riggs[2] who says that "the occurrence of local syncope and local asphyxia, either separate or associated, constitutes what is known as 'Raynaud's phenomena,' but the additional element of gangrene is necessary to justify a diagnosis of Raynaud's disease." Now if we are to accept Riggs' definition, and also Raynaud's original view that symmetry of the lesions and absence of demonstrable changes in the blood vessels are two essential features, then in fulfilling those requirements for a diagnosis, it will be found that extremely few cases of Raynaud's disease have been reported in this country. In England, France, Russia and Germany, however, symmetrical gangrene of the extremities seems to be much more frequently encountered.

1. Raynaud: De l'asphyxia locale et de gangrène symétrique des extrémités, These de Paris, 1862.
2. Riggs, C. E.: Reference Handbook of Medical Sciences, New Ed., New York, William Wood & Co., 1900, vi, 844.

In a review of the literature here, we find a variety of conditions reported as Raynaud's disease. Some authors[3] cite as cases conditions which appear to be due solely to certain occupations, while others[4] describe asymmetrical Raynaud's disease in which trophic ulcers, diabetes and other pathologic changes are clearly set forth. Numerous instances can be given in which the diagnosis is at least clouded in doubt. Not only is gangrene usually lacking but in many "cases" there is even failure to establish the existence of Raynaud's phenomena.

In looking over the clinical records of the Cook County Hospital, an institution which treats about 30,000 patients annually, as far back as the records are available (1911), I found but three cases with a diagnosis of Raynaud's disease. This is of interest in that: (1) it indicates how rare the condition really must be and (2) it illustrates how a diagnosis of Raynaud's disease may be made though the clinical evidence does not seem to entirely warrant it. All three of the cases just referred to were in adult males. One patient was in the hospital for eight days; ankles and knees were both swollen, while his chief complaint seems to have been pain in the rectum. Weiss has described the latter symptom in a case. In Case 2 the patient had rheumatic pains in ankles and shoulders. He was in the hospital twenty days and the history states that he had "rheumatism six times before." The third patient applied for admission to the hospital at 11:40 a. m. and left at 12:30 p. m. the same day. He was in the hospital forty minutes; he refused to allow a physical examination and left. The diagnosis on his clinical record is Raynaud's disease.

Symmetrical gangrene, fourth day. Remains of old varicella lesions are also shown.

Osler[5] says that in a period of twenty years at the Johns Hopkins Hospital there were but nineteen cases among about 20,000 patients admitted. Of thirty-two cases reported as Raynaud's disease in the United States, previous to 1900, twelve, or about 37 per cent., had symmetrical gangrene, and of the twelve, there appears to have been only one[6] in which all four extremities were involved simultaneously. Hyde[7] reported three cases of "hand and foot disease" in which all four extremities were involved, but there was no true gangrene, the chief characteristic, apparently, having been an onychauxis.

Of ninety-seven cases in the literature, gangrene occurred in forty-nine, but in only thirty-three of these cases was it symmetrical and in many of these latter instances it was extremely superficial. In twenty-one of the thirty-three symmetrical cases, the lower extremities were involved, in nine the upper, in two,[8] both upper and lower and in one,[9] one upper and both lower extremities showed gangrenous changes while the tip of the nose and a portion of one ear was discolored.

ETIOLOGY

Very little is known concerning the etiology. Cases are more frequent in the cold months following exposure. Nevertheless, changes of temperature within doors, which are almost imperceptible, may be sufficient to bring on an attack.

Monro states that heredity is a factor in 8 per cent. of the cases. Nationality also appears to play a part. Of the reports reviewed by me, among which seventeen patients were reported as of foreign birth, more than 50 per cent. were Russians, and in my own case the child was of Polish parentage. Apparently the most severe cases are among foreigners. The disease may occur at any age[10] from infancy up. Of eighty-nine cases in which the age was given, approximately 11 per cent. were under 20 years, 17 per cent. over 50 years and 72 per cent. between the ages of 20 years and 50 years. It is quite generally stated that females are much more frequent sufferers than males. In a review of ninety-five cases, however, I found conditions diametrically opposite, the males being in the majority with 56 per cent., while the cases in females totaled but 44 per cent. It is not necessarily the weak and debilitated who are the victims of this disease.

Some of the predisposing factors are thought to be fright, epilepsy and various neurotic conditions. Anæmia, syphilis, tuberculosis and malaria are also frequently mentioned and the invasion of pathogenic bacteria, as in the common infectious diseases of childhood, resulting in a lowered vital resistance, deserves careful consideration. The condition has been preceded by injury and hemorrhages, though under such circumstances there is likely to be some doubt in the diagnosis.

SYMPTOMS

Symptoms have previously been touched on. Pain and an absence of fever at the onset are characteristic.

3. Cargile, C. H.: Raynaud's Disease in Stone-Cutters Using Pneumatic Tools, The Journal A. M. A., Feb. 13, 1915, p. 582.
4. Montgomery, D. W.: Asymmetrical Raynaud's Disease, Jour. Cutan. Dis., 1915, xxxiii, 119.
5. Osler: Principles and Practice of Medicine, Ed. 8, New York, D. Appleton & Co., 1912, p. 1120.
6. MacFarland: (Tr. Coll. Phys., Philadelphia, 1898, xx, 160) reports a case of moist gangrene.
7. Hyde, J. N.: Three Cases of Symmetrical Hand and Foot Disease, Med. News, Philadelphia, 1887, L, 416.
8. Morgan, J. D.: Symmetrical Gangrene (Raynaud's) Versus Endarteritis Obliterans, The Journal A. M. A., Nov. 29, 1902, p. 1359.
9. Willson, R. N.: Fatal Vasomotor Gangrene Probably due to Raynaud's Disease, Tr. Coll. Phys., Philadelphia, 1911, xxxiii, 209.
10. Sachs, B.: Nervous Diseases of Children, New York, William Wood & Co., 1905, Ed. 2, p. 203; Green's Encyclopedia of Medicine and Surgery, William Green and Sons, Edinburgh and London, 1910, vii, 468.

Tips of fingers and toes are most commonly affected; more rarely ears and tip of nose. Contrary to the assertions of most authors, it appears that in the majority of cases reported, the lower extremities were involved. Hyperesthesia to touch is common, and in the first stage or local syncope there is no pitting on pressure.

Loss of sensation in the part affected usually follows when gangrene occurs. While gangrene in Raynaud's disease is presumed to be of the dry variety, some authors state that it may be moist and such was the condition in Macfarland's[6] case. It is not infrequently stated in connection with the symmetrical gangrene of Raynaud's disease that, when tissue death occurs, blebs filled with serum appear on the surface. There was nothing of that character in my case though most reports confirm the assertion. A line of demarcation is usually well developed within a week and the part involved assumes a black, dried, leather-like appearance.

PATHOLOGY

The anatomic cause for true Raynaud's disease is still to be discovered. In 1832, M. Victor Francois[11] of Mons expressed our present knowledge of this condition very aptly when he said "Everything concerning spontaneous gangrene is in a state of distressing uncertainty."

Raynaud believed the condition was caused by a spasm of the arterioles due to some derangement of the central nervous system; that the symmetrical gangrene was due to some error in the innervation of the capillary vessels. Weiss, however, thinks it is not so much the arteries which are contracted as corresponding veins. He also regards the gangrene as trophic, that the vascular spasm is not the cause. Pitres and Vallard[12] found structural nerve changes in cases of symmetrical gangrene. Lustgarten[13] appears to believe that a syphilitic origin is always to be suspected. No pathologic changes, however, should be found in the intima of the vessels in Raynaud's disease. And yet, in spite of this fact, the opinion has been advanced that the condition is due to a proliferation of the endothelial cells. Morgan[8] states there should be no proliferation. It has been suggested by Koga of Japan that an increased viscosity of the blood is responsible for symmetrical gangrene, but such a view is hardly tenable. The theory has also been advanced that the disease is due to some sudden bacterial invasion.

That the central nervous system is partially at fault there can be no doubt. In my case, regardless of what the complete mechanism was, it would seem as though the numerous acute infectious diseases produced a toxemia which impaired the central nervous system either primarily or else secondarily through nutritional changes in the blood.

Granting then that the central nervous system is at fault, it would seem that the origin of many if not all such cases may lie in a depleted blood supply. In other words, the nervous system lacks the proper nourishment necessary to maintain its equilibrium and thus control over the vasomotor system is lost. All reports of symmetrical gangrene seen by me which gave the blood findings showed a marked anemia.

11. Francois, M. Victor: Mentioned in Barlow's Translation of Raynaud's Article for the New Sydenham Society, London, 1888.
12. Pitres and Vallard: Arch. de physiol., 1885.
13. Lustgarten, A.: Jour. Cutan. Dis., 1906, xxiv, 272.

DIFFERENTIAL DIAGNOSIS

If any assignable cause can be given for the affection, it is likely that it is not a case of Raynaud's disease. The following diseases and conditions should be carefully considered and excluded before a diagnosis of Raynaud's disease in any of its forms is made: (1) frost bite, (2) rheumatism, (3) occupational disorders,[3] (4) cardiac defects, (5) embolism, thrombosis, phlebitis, (6) arteriosclerosis, (7) trophic disturbances due to disease of the central nervous system, (8) albuminuria, (9) chronic ergotism or plumbism, (10) diabetes, (11) senile gangrene, (12) traumatism, (13) Morvan's disease, (14) syphilitic endarteritis, (15) sclerodactylia,[14] (16) bilateral ainhum, (17) leprosy, (18) infections including typhoid, malaria, etc., (19) endarteritis obliterans, (20) erythromelalgia, (21) peripheral neuritis, (22) purpura, (23) angioneurotic edema.

Without discussing each of the foregoing, I believe the history in my case will demonstrate that they are all easily excluded. Endarteritis obliterans or thromboangiitis as Buerger[15] terms it, might be considered but this condition is progressive and would hardly develop with such rapidity. Collins[16] has written a valuable paper on the classification of circulatory and trophic disturbances.

PROGNOSIS

The disease usually exists for a number of years and acute fatal cases are extremely rare. Even in cases with severe symmetrical gangrene, the outcome is as a rule favorable despite the fact that one or more limbs may be eventually lost. Nevertheless, Fischer[17] states that while records of cures exist, the diagnosis may always be questioned.

TREATMENT

Practically everything has been tried in the way of treatment, including nerve stretching,[18] the Roentgen rays, galvanism and Bier's[19] hyperemia; atropin, nitroglycerin, thyroid extract, salvarsan, injection of normal salt and Ringer's solution. All have had their advocates. Peyton[20] believes that drugs are of no value.

Symptomatic treatment is all that can be advised. The parts should be kept warm and dry and when gangrene develops the case must be considered from a surgical point of view. The illustration, from a photograph taken June 17, the fourth day of the affection, is of particular interest in showing the distribution of the parts involved.

REPORT OF CASE

S. U., a fairly nourished, light complexioned boy 5 years of age, was admitted to my service at the Cook County Contagious Disease Hospital, May 4, 1915, suffering from scarlet fever of three days' duration. He had been an inmate of an orphanage. No other history was obtainable at that time.

Subsequently the following history was secured. Father and mother, of Polish nationality, were both living and well. Two other children, aged 8 and 6 years, were living and well. The first child died of some "head sickness" in the second year of its life. The mother had never had any miscarriages and was six months pregnant.

14. Mix, C. L.: Chicago Med. Recorder, 1901, xx, 356.
15. Buerger, L.: (Am. Jour. Med. Sc., 1915, cxlix, 210) writes concerning vasomotor and trophic disturbances of the upper extremities with particular reference to thrombo-angiitis obliterans.
16. Collins, H. N.: Ann. Surg., 1914, lx, 742.
17. Fischer, L.: Diseases of Infancy and Childhood, Ed. 3, F. A. Davis Co., Philadelphia, 1910, p. 883.
18. Hendon, G. A.: Kentucky Med. Jour., 1908-1909, vii, 221.
19. Cushing, H. W.: Boston Med. and Surg. Jour., 1904, cli, 269.
20. Peyton, D. G.: Am. Med., 1904, vii, 518.

The patient had never been ill before; neither coldness nor blueness of the extremities nor hemorrhages of any character had been either complained of or observed. When minor injuries occurred, the blood always clotted readily.

Physical Examination.—The patient presented a typical rash of scarlet fever and did not appear to be extremely ill.

The tonsils were large and inflamed but there was no membrane. Throat and nasal cultures were negative for diphtheria. There was a moderate cervical adenopathy but all other findings were negative.

When admitted to hospital, patient's temperature was 103 F., pulse 126, respiration 32.

The temperature showed a gradual decline until on the fifth day after entrance it began to rise. This elevation of temperature continued for four days when the eruption of measles appeared on the eighth day after admission to hospital. The patient, then, was in the hospital but four days before the onset of measles and consequently contracted this disease outside.

On the fifteenth day after entrance, it was noted on the clinical record that the extremities were cold. On the seventeenth day after entrance, about twelve days following the measles onset or twenty-one days after the onset of scarlet fever, a double otitis media was evidenced by discharge from the ears. The temperature had been normal since the eighth day following the measles onset and there was no elevation of temperature accompanying the involvement of the ears. The child's condition was such that he was allowed to be up and about the ward on the twentieth day after entrance.

Six days later, or twenty-six days after admission, some swelling in the region of the right parotid gland was observed and it was believed the patient had contracted mumps. There were no cases of mumps in the hospital at this time but there had been one case in the same ward several weeks previously. There was no fever at this period nor was the region of the left parotid swollen at any time.

From May 30 till June 6, the temperature continued normal, but on the latter date, an eruption of varicella appeared. The lesions were profuse and the temperature rose to 104. The child had a good vaccination scar. On June 6, the patient coughed a good deal and on the following day a whoop was noticed. In the meantime the varicella lesions continued to appear in fresh crops daily until June 11. During this period the temperature remained high for the greater part of the time but on June 11 it had again reached normal. At this time the patient was somewhat anemic but otherwise his condition was fair. The whooping cough was not of a severe type, the paroxysms being comparatively few in number.

About 8 a. m., June 14, the forty-sixth day after the onset of scarlet fever, the thirtieth day after the onset of measles, the ninth day after the onset of varicella and the seventh day after the beginning of whooping cough, large patches of a bluish black hue appeared on the dorsum of the feet near the base of the toes. Smaller patches on the back of the right wrist were also evident and a small area of discoloration on right cheek. These areas were at first thought to be purpuric in character. The following examinations on this morning with their results follow: heart absolutely negative. Blood count showed 54,000 white cells (due to pertussis), with a differential count of 82 per cent. small lymphocytes, 6 per cent. large lymphocytes and 12 per cent. polymorphonuclear neutrophils. The coagulation time of the blood was about seven minutes. The urine showed a slight amount of albumin with hyaline and granular casts. There was no sugar, no hemoglobinuria. Blood was not present in either the urine or feces.

By evening of June 14, the areas had enlarged. The entire right lower extremity was involved from about one half the distance from the knee down, slightly more posteriorly than anteriorly, the greater part of the calf being affected. The left lower extremity was less affected, the big toe and second toe not being included in the process which did not extend up beyond the ankle except for a separate patch situated posteriorly about the middle third of the calf. During this first day an area, identical in appearance with the others, had developed on the left cheek. This was about the size of a quarter while the patch on the opposite cheek was as large as a silver dollar. All areas described were rather sharply defined and extremely painful. Proximally for some distance above the cyanotic areas on all four extremities the skin had a swollen, tense, waxy appearance. It looked edematous but was rather hard, did not pit on pressure and was very painful. All the affected parts were icy cold from the first. The temperature on this day did not go above 99, pulse 106, respiration 24.

Second day, June 15: Both ears were now discolored over the upper half and became black and cold. The lower extremities began to look gangrenous but there was no extension of the process. In the upper extremities, the left two ulnar and the right three ulnar fingers were black and cold. No blebs containing bloody serum as frequently noted in these cases were observed on any of the areas involved.

At the beginning of the process it was thought to be of a purpuric nature and horse serum was given intramuscularly in 10 c.c. doses every six hours until the end of the second day. On the second day the temperature rose to 101.8 in the evening. The urine showed a faint trace of albumin and there were some hyaline casts.

Third day, June 16: The only change in the lesions was a deepening of the black color, the parts affected remaining ice cold. An examination of the chest disclosed a bronchopneumonia; temperature 103, urine negative. Patient looked very anemic and a blood count showed red cells, 1,840,000; hemoglobin, 35 per cent. (Sahli); white cells, 41,550. Differential: small lymphocytes, 49 per cent.; large lymphocytes, 10 per cent.; polymorphonuclear neutrophils, 37 per cent.; eosinophils, 2 per cent. and transitionals, 2 per cent. On this day the left thumb and thenar eminence appeared very pale and waxlike. Lines of demarcation were being established. The areas on the cheeks appeared improved but the right forefinger had become cyanotic as far as the first phalangeal joint. The patient's general condition appeared greatly improved on this day in spite of his bronchopneumonia. The temperature was 102.2 F., pulse 148, respiration 48. The pain was greatly decreased. He had a good appetite and was much interested in everything about him.

June 18, the fifth day, the boy managed to get the dressings loose and chewed off the tip of the third right digit. There was no bleeding, the finger end resembling a piece of old leather. The gangrenous areas had an offensive odor at the lines of demarcation. The urine continued negative. The pulmonary condition was less favorable. Temperature rose to 103, pulse 144, respiration 58.

June 19, the sixth day, suppuration at the lines of demarcation was evident but all of the original areas were in a state of dry gangrene. The patient had involuntaries. Temperature 102 to 104 F.

June 20, the seventh day, the patient was irrational. The gangrenous portions showed no extension and were assuming the dried leather boot appearance. The skin of the affected parts was an ebony black. All parts were dressed with magnesium carbonate and powdered boric and the open-air treatment adopted.

June 21, the eighth day, the gangrenous portions were drying and beginning to separate. There was little change in the general condition.

June 22, the ninth day, the gangrenous portion of the right ear fell off, leaving a clean border. Temperature fell to 98.6, pulse 148, respiration 36.

June 23, the tenth day, the gangrenous portion of the left ear dropped off leaving a clean margin as in the case of the other ear. The uninvolved parts of the left hand looked very pale, swollen and waxlike. The boy was restless and irrational. Temperature 99 to 101.

June 24, the eleventh day, all the gangrenous areas were becoming loose from their adjoining tissue. On the extremities at the lines of demarcation the slough appeared to extend only to the deep fascia.

June 25, the twelfth day, the bronchopneumonia seemed slightly improved. Temperature 99.2. Dr. Joseph M. Patton kindly made an examination of the patient's heart on this day and reported the findings negative.

June 26, the thirteenth day, the gangrenous patch on the right cheek dropped out without much tissue destruction. Blood for a Wassermann was taken which was later reported negative.

June 27, the fourteenth day, the gangrenous patch on the left cheek extended to a slightly greater depth than on the opposite side and the resulting scar was consequently more extensive. The general condition of the patient was considered fair under the circumstances, though the pulse and respiration were rapid and bronchopneumonia was still present. The child, however, seemed to be losing in strength. He was toxic, had involuntaries, but apparently suffered little pain. The involved regions were dry except at the demarcation borders, and were shriveling up and separating. On the evening of this day, the child died as a direct result of the pneumonia, but a general toxemia was of course a strong contributing factor.

Had it not been for the pneumonia, it is possible the patient would have eventually recovered. Nevertheless amputation of both lower extremities, one at the upper third and one at the middle third of the leg, would have been inevitable. It would also have been necessary to adopt a similar procedure with respect to the greater part if not all of both hands.

The blood examination on the last day was as follows: Red cells, 1,650,000; hemoglobin, 27 per cent. (Sahli); white cells, 36,000. Differential, 200 counted, small lymphocytes, 41 per cent; large lymphocytes, 4 per cent.; polymorphonuclear neutrophils, 51 per cent.; eosinophils, 1 per cent.; transitionals, 3 per cent.

NECROPSY

In 1901, Greiwe[21] stated that the number of cases of Raynaud's disease examined postmortem could be summed up on the fingers of one hand. Consequently it is to be regretted that space does not permit the presentation of the complete necropsy findings.

Among the chief points demonstrated by Dr. H. Gideon Wells, who performed the necropsy, are the following:

On cut section, the gangrenous areas over the legs were found to be markedly edematous and to involve all the soft tissues down to the bone, which also showed erosion. The thymus was smaller than normal. The thyroid seemed somewhat enlarged and succulent; no gross changes were noted.

The heart was normal in size. No changes were seen in the aorta. The valves were normal.

The lower lobes and lower half of the upper lobes of the lungs were consolidated.

The kidneys were very pale, somewhat firmer than normal. Cross-section showed them markedly pale but otherwise normal. The adrenals were enlarged.

The large vessels of the lower extremities showed no evidence of thrombosis or embolism. The right femoral vein showed a large antemortem clot.

ANATOMIC DIAGNOSIS

1. Acute symmetrical dry gangrene of both lower extremities, both upper extremities and cheeks, with beginning sequestration.
2. Thrombosis of right femoral vein. Dr. Wells believed this to be of recent formation and secondary to the gangrenous process.
3. Bilateral confluent pneumonia of both lower lobes. Discrete bronchopneumonia of both upper lobes.
4. Acute hyperplasia of peribronchial lymph glands.
5. Perilobular infiltration of liver.
6. Fatty degeneration of the kidneys.
7. General lymphadenoid hyperplasia including glands, spleen and Peyer's patches, the latter of which were pigmented.

Later Dr. Wells reported that the histologic examination gave no definite findings which could throw light on the etiology of the gangrene.

Dr. George Mather, of the Memorial Institute for Infectious Diseases, conducted a bacteriologic examination. He made cultures from the thrombus of the right femoral vein and isolated a green streptococcus and a hemolytic streptococcus. Injected into rabbits, these caused a malignant endocarditis.

25 East Washington Street.

21. Greiwe: Philadelphia Med. Jour., 1901, viii, 236.

AN UNUSUAL CASE OF SALVARSAN POISONING

KARL C. EBERLY, M.D., FORT WAYNE, IND.

Mr. B., aged 36, consulted a physician for lightning pains in the calves of his legs, occurring chiefly at night. Family history was negative. His past history gave no definite evidence of syphilis, although, twelve years ago, he had gonorrhea and thought possibly that he had contracted syphilis at the same time. The Wassermann on the blood was strongly positive. Physical examination was negative. Neural examination showed no other signs than absent knee-jerks. No examination of the spinal fluid was made.

An early tabes was diagnosed and neosalvarsan was chosen for treatment. Through an error 0.6 gm. of salvarsan was mixed in 10 c.c. of freshly distilled water, only a part of it dissolving. This unneutralized solution of salvarsan was injected into the cephalic vein of the right arm. Almost instantly the patient complained of a choking sensation and constriction of the pharyngeal muscles. He became extremely pale, pulse was small, weak and rapid. Respiration was dyspneic. At once the needle was removed, about 5 c.c. having been injected. Within an hour he was markedly prostrated, coughed and vomited and complained of general weakness and pain in the region of the left kidney. Nitroglycerin 1/100 grain was administered orally every twenty minutes until the pulse improved. Then it was repeated every two hours.

For the next twenty-four hours his general condition remained the same. He voided no urine. A catheterized specimen of 3 ounces showed a trace of albumin but no casts. On the second day the pain in the region of the left kidney and suppression of urine continued. The patient complained of weakness, chilling and a general myalgia. A phlebitis started in his cephalic vein, extending from the point of injection to the shoulder. The arm was swollen, reddened and painful. The vein appeared to be completely obliterated. His temperature and pulse were 100.

On the third day I was consulted over the long distance telephone. Fischer's solution, hot packs, saline cathartic, potassium acetate and digitalis were suggested to increase the elimination and local applications for the phlebitis. Fischers' solution, 6 to 8 ounces, was given every four hours by rectum and 1 dram of sodium bicarbonate every two hours by mouth. The other drugs were administered in the customary dosage. During the next twenty-four hours he excreted 15 ounces of urine, and the pain in the region of his left kidney was much improved. His prostration diminished but the severity of the phlebitis increased. His arm became much more painful and swollen. His temperature was 101, pulse, 105. On the seventh day I first saw the patient. He was a strong, powerfully built man, well nourished but now appeared thoroughly exhausted. He complained of weakness and pain in the right arm. This arm was twice its normal size and severely inflamed. The cephalic vein was palpated as a rigid tube. Physical examination of the heart and lungs was negative. The pulse was rapid—100—but of good volume and tension. Temperature was 102.4. Since the third day the amount of urine had gradually increased to normal. The urine showed a trace of albumin without casts.

The leukocytes numbered 12,500. The differential gave 80 per cent. polymorphonuclears. The diet had been liquid.

After six weeks the phlebitis subsided, the urine became free from albumin and apparently he has not suffered any permanent lesion from this mistake.

Whether the marked toxic symptoms were due to the acidity of the solution or the salvarsan would be difficult to say. It is of interest, however, to note that the alkaline therapy relieved the anuria and toxic symptoms almost immediately.

Gauntt Building.

TUMOR OF THE HAND CAUSED BY FOREIGN BODY

F. P. Hammond, M.D., Chicago

R. S. S., an American, aged 30, complained of a tumor mass the size of a hazelnut which had been deeply seated in the thenar eminence of the left hand as long as he could remember. Only occasionally did the mass produce any discomfort yet a constant worry possessed him lest some day it should turn into a cancer. About six weeks ago it began to enlarge toward the surface, became slightly reddened and tender and seemed to grow gradually and slowly worse, which alarmed him sufficiently to cause him to seek treatment.

His family history was negative. His past history was negative, except that about two months ago he remembered giving the "lump" an accidental bump while swimming, a fact he had almost forgotten because it caused him so little pain.

For the last six years the patient had been a university student, previous to which time he worked on his father's farm. He denied venereal history.

A general examination was negative in result; there were no other enlargements. Temperature and pulse were normal.

Local examination revealed the tumor to be hard and elastic, movable, with a cone-shaped projection toward the surface, slightly tender and reddened but with no demonstrable fluctuation and apparently no connection with the bone.

The Wassermann test was negative. The Roentgen ray revealed nothing.

Diagnosis of a chronic attenuated infection probably due to a foreign body was made and under local anesthesia the mass was incised. About 1 cm. from the surface the slightest bit of pus exuded. Deep in the center of the mass a locust thorn 8 millimeters in length was discovered and removed.

On seeing the thorn he exclaimed, "Well, let me see, I was about 11 or 12 years old when I got that sliver." It is needless to say an uneventful recovery followed.

30 North Michigan Boulevard.

Removal of Swallowed Foreign Bodies.—The following may be of interest to some on account of the simplicity of the treatment. I claim no originality for it: Mr. C. B., aged 29, came to my office, October 7, complaining of a pricking sensation in the left hypochondrium, annoying him, but felt only occasionally. Twenty-four hours previously, while eating some pudding, he bit on a hard object, which proved to be a piece of glass. He did not think he swallowed any glass, but in view of the history, I concluded that he had. I gave him about 2 or 3 drams of absorbent cotton, with instructions to pick it into small shreds, put them into a glass of milk and drink the mixture. In addition, I gave him half an ounce of magnesium sulphate crystals, with instructions to dissolve in a half glass of water, and take one hour after the milk and cotton. The motions were passed in a vessel, and on examination, a wedge-shaped piece of glass about three-eighths inch long, very sharp, was found entirely covered with cotton. The pricking sensation disappeared. Tacks, pins and other pointed or rough foreign bodies may be easily removed by this means in many instances.

R. Penn Smith, M.D., Pittsburgh.

Therapeutics

TOXICOLOGY OF EMETIN

Dr. F. B. Sigworth, Albuquerque, N. M., writes:

Will you please give me the toxicology of emetin hydrochlorid used in hemorrhage? I wish to test it for its effect in tuberculosis; also to try it out experimentally on guinea-pigs.

Comparatively little has been added to our knowledge of the systemic actions of emetin in mammals during the past few years, and the descriptions in recent text books of toxicology are much like those given by Lewin in 1888.

The following statement is based largely on the statements of Kunkel[1] and von Jaksch.[2]

Emetin is an active local irritant, causing inflammation, and even ulceration of the tissues with which it comes into contact in sufficient concentration. When powdered ipecac is handled, it may give rise to irritation of the eyes and even ulceration of the cornea, and cause burning in the mouth and throat. The inhalation of the powder causes a sense of oppression in the chest and difficulty in respiration (so-called emetin asthma).

The application of an ointment containing emetin or ipecac to the skin causes irritation, progressing to pustulation with the continued application of strong preparations.

The subcutaneous injection of emetin causes pain, swelling and even ulceration.

Emesis following the oral administration is generally attributed to the local irritant action on the gastric mucous membrane; if emesis fails to occur and emetin passes into the intestine, it gives rise to diarrhea, and this may be bloody, the latter effect being augmented by the extreme dilation of the intestinal vessels. If absorption occurs, systemic effects follow.

The systemic effects observed after the entrance of emetin into the blood stream include general depression with failure of respiration, due to paralysis of the center, and cardiac failure due to the direct action of the emetin on the heart and circulation. There is a profound fall of blood pressure because of the cardiac and vascular effects.

The central nervous system undergoes rapid depression and paralysis even in the frog, which is not immediately killed by removal of the heart. Emetin stops the mammalian heart in diastole.

Alterations in the blood have been described; these are attributed to the accumulation of acid products of metabolism, but they are not responsible for the effects just described.

Kunkel describes the effects of toxic doses of from 50 to 100 mg. per kilogram of body weight in the cat and dog, but the results of experiments performed in the laboratory of the writer (unpublished) show that as little as 2 mg. of emetin per kilogram administered intravenously may cause some depression at times, while doses of from 8 to 12 mg. per kilogram cause general depression with weakened and accelerated heart and lowered blood pressure. There is an apparent improvement after a short time, but usually these doses are fatal within forty-eight hours. The effects of the oral administration of emetin in solution are about like those seen after intravenous injection, but

1. Kunkel: Handbuch der Toxicologie, 1901, p. 841.
2. Von Jaksch: Die Vergiftungen, Ed. 2, 1910, p. 493.

death may occur with general paralysis and cardiac failure within three minutes after the intravenous injection of a large dose (15 mg. per kilogram).

It is generally stated that emetin causes emesis only through its action on the gastric mucous membrane, but it also causes emesis after the intravenous injection into a dog from which the gastro-intestinal tract has been removed; hence it is also capable of acting on the vomiting center directly.

One observer reported that vomiting, colic, abdominal cramp and collapse occurred, followed by death within an hour and a half after a patient had taken a large amount of wine of ipecac. Hyperemia of the stomach and duodenum were found at necropsy.

Several authors state that the toxicology of emetin is not very important, and von Jaksch states that the prognosis in case of poisoning by it is good. The diagnosis is made by finding the alkaloid in the vomitus.

Emetin is absorbed from the gastro-intestinal tract when given in solution more readily than when administered in the form of a preparation of ipecac. Tannin, in the form of krameria, is recommended as the antidote in such cases.

The following observation of Kunkel's is interesting in view of the date of his writing it and the use of emetin in hemoptysis at present. He says (1901) that it was formerly believed that emetin induced a specific anemia of the lungs from which circumstance it was used in hemoptysis. He states that the belief probably arose from the observation that the pulmonary vessels of animals that had been killed with emetin were empty, which he explains as being due to the maximal dilation of the vessels of the splanchnic area, with the consequent drainage of the pulmonary vessels.

This observation of Kunkel's is at least worthy of attention at this time, in view of the fact that even small doses of emetin are capable of causing depression.

THE SO-CALLED CONCENTRATED SOLUTION OF SILVER IODID

John K. Thum, Ph.G., pharmacist at the German Hospital, Philadelphia, writes:

There is on the market, at the present time, a so-called soluble preparation of silver iodid. That is to say, the silver iodid is in concentration in the form of a solution, and the addition of this solution to a designated volume of water makes a 5 per cent. suspension of silver iodid. Whether this method of dispensing silver iodid possesses any advantages over the usual method is questionable. In my opinion it would be far safer for a patient to receive a freshly prepared precipitate of this chemical, well washed, and held in suspension with the aid of a solution of gelatin, Irish moss, or some other appropriate gummy substance.

This solution of silver iodid is made by taking advantage of the fact that silver iodid is soluble in an excess of potassium iodid. One of the claims made for this preparation is that "it is also less expensive" than preparations of the same salt sufficiently diluted for immediate use. When one considers that the solution of this salt requires *a considerable excess* of potassium iodid (the preparation on the market showing on analysis at least 60 per cent. of free potassium iodid), and then considers the price of potassium iodid even in normal times, one is averse to agreeing with this statement.

It is also well to remember that potassium iodid as found on the market is usually quite alkaline, and while it may be true that such a preparation is painless when introduced into the urethra, this does not prove that it is harmless. It is also well to remember that suspensions of silver iodid are frequently used in eye infections, and for that purpose should be very carefully prepared, the silver iodid first being carefully and thoroughly washed with sterile distilled water. If this technic is not followed, the application of the preparation to an eye condition will result in much irritation, pain and an inflammatory condition which it is difficult to control.

My investigation of this preparation revealed that it can be prepared readily according to the following formula:

	gm. or c.c.
Silver nitrate	3.70
Potassium iodid	17.00
Distilled water, ad	25.00

This volume of 25 c.c. solution, when added to 75 c.c. of distilled water, makes a 5 per cent. suspension of silver iodid.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

BISMUTH TRIBROMPHENATE.—Bismuthi Tribromphenas.—Bismuth Tribromphenol.—$Bi(C_6H_2Br_3O)_3OH.Bi_2O_3$.—Basic bismuth tribromphenate.

Actions and Uses.—Bismuth tribromphenate is claimed to be a nonirritant and nontoxic antiseptic. It is said to be useful as an odorless and efficient substitute for iodoform; as valuable in ulcus cruris and all weeping eczemas; internally, in gastro-intestinal catarrh, proctitis, dysentery, bacillary and choleraic diarrhea, cholera infantum, etc.

Dosage.—From 1 to 3 gm. (15 to 45 grains) per day to adults; from 0.12 to 0.3 Gm. (2 to 5 grains) at a dose to children. Externally, as a dusting powder, in bandages, etc., like iodoform.

Nonproprietary Preparation:

Bismuth Tribromphenate, Merck, Merck and Co., New York.

It is a fine yellow, nearly odorless and tasteless powder, neutral in reaction, and unaffected by light. It is only slightly soluble in water, alcohol, chloroform, liquid petrolatum and vegetable oils, but soluble in 2 per cent. hydrochloric acid. By alkalies it is decomposed with the formation of bromide; it is not decomposed by heat at temperatures below 120 C., and therefore may be sterilized.

It should yield not less than 49.5 per cent. of bismuth oxide. If 1 Gm. is boiled with sodium hydroxide T. S. and filtered, the filtrate rendered acid with sulphuric acid and the white, curdy precipitate washed and dried, it should melt at 95 C. (tribromphenol).

It is incompatible with alkaline mediums and should not be heated above 120 C.

BUTYL-CHLORAL HYDRATE (See N. N. R., 1915, p. 77).—The following non-proprietary preparation has been accepted:

Butylchloral Hydrate Merck.—Manufactured by E. Merck, Darmstadt, Germany (Merck and Co., New York).

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SATURDAY, NOVEMBER 13, 1915

SUGAR IN NORMAL URINE

With the increasing number of tests for the presence of sugar in the urine has come an attempt at greater delicacy in the reaction involved. Just as Fehling's test far exceeded in sensitiveness some of the older methods for the detection of sugar, so the newer tests recommended from time to time have as a rule been characterized by the property of revealing smaller and smaller amounts of the carbohydrate. With the exception of the fermentation test, most of the reactions are really indirect in indicating the presence of sugar. Most of them are reduction tests involving the use of salts of copper or other metals.

Inasmuch as other urinary components besides sugar may reduce the cupric solutions, it is sometimes difficult to decide whether traces of observed reaction are due to sugar or to other constituents such as creatinin. From this point of view a reagent may sometimes be unduly sensitive and give a false answer in respect to the occurrence of sugar. On the other hand, certain urinary compounds also interfere with the delicacy of the tests by preventing the separation of small amounts of red cuprous oxid on the familiar appearance of which the clinical observer so often depends.

Folin[1] has lately devised a reagent which combines extreme sensitiveness to sugar with the property of removing creatinin and other interfering substances from the urine. In the course of nearly a hundred tests made with this new reagent on the urines of as many different normal persons (students), Folin obtained a positive reduction in every case. This corresponds with the statement occasionally made that traces of sugar are present in practically every urine. Various investigators have succeeded in demonstrating the probability of this by concentrating larger amounts of urine and making tests on suitably prepared fractions thereof.

It would, after all, be strange if an organ like the kidney which responds so readily to very small changes in the usual concentration of blood sugar should retain an absolutely complete impermeability to a sugar level only very slightly lower than that which leads to easily detected glucosuria. It is theoretically easier to conceive of the "impermeability" as being relatively rather than absolutely perfect; or, if one is committed to a different explanation of the sugar-free character of normal urine, a comparable contrast applies with equal force. The demonstration given by Folin's new test therefore need not surprise us. As he says, the amount of sugar present in normal human urine is probably greater than is indicated by the negative findings recorded on the basis of the clinical qualitative tests for sugar in current use. Those who, like life insurance examiners, change their analytical methods from time to time in order to secure greater sensitiveness and detect smaller contents of sugar in urine, must be prepared to reach a point at which they encounter normal rather than pathologic sugar excretion. This is only an added instance of the vague borderline between the normal and the abnormal.

1. Folin, O.: A Qualitative (Reduction) Test for Sugar in Normal Human Urine, Jour. Biol. Chem., 1915, xxii, 327.

THE LOCALIZATION OF STREPTOCOCCI

The relation to infection of the affinity of bacteria for certain tissues was discussed recently in these columns.[1] It was pointed out that many of the pathogenic bacteria in their localization manifest a special affinity for some particular tissue or tissues. This elective localization may be conceived to be due to the circumstance that the conditions for growth are more favorable in some tissues than in others. On account of differences in metabolism and chemical composition, there is no doubt that different tissues and places in the body present radically different conditions for bacterial growth and activity. It was pointed out, further, that the work of Forssner and especially the more recent work of Rosenow have established that among the streptococci, which have the power to invade many tissues and to cause a variety of infections, strains may appear which, when introduced into the blood, are found to localize by preference in certain tissues. In his article in this issue of The Journal, Rosenow[2] presents a summary of the results of his experiments of elective localization of streptococci obtained from a wide range of human infections and injected intravenously into dogs and rabbits. The animals were killed soon after the injection, and the facts as to localization of the streptococci determined by systematic, careful examination of the whole body. Obviously this method gives a much better idea of early localization than can be obtained if only the animals that die are examined.

Stated in the simplest way, the results obtained by Rosenow with his method show (1) that streptococci

1. The Relation of Selective Tissue Affinity to Infection, editorial, The Journal A. M. A., Sept. 26, 1915, p. 1114.
2. Rosenow, E. C.: Elective Localization of Streptococci, The Journal A. M. A., this issue, p. 1687.

isolated from active lesions in different human organs and tissues, in many instances, have a pronounced affinity for the corresponding organs and tissues in rabbits and dogs, and (2) that streptococci isolated from the tonsils and pyorrheal pockets in persons with active streptococcal infection in the interior of the body may have the same sort of affinities as the streptococci from the internal lesions. In the light of these results, many of which are striking indeed, as may be seen at a glance from the table in Rosenow's article, human streptococcus infections acquire new interest because a road now opens to a better understanding of their genesis and of the difficulties of curing them by the specific means now in use. Obviously a chief danger from chronic foci in which streptococci are present, of which those in the tonsils and about the teeth appear to be the most important because the most common, seems to depend on the fact that in such foci, even when quiescent, streptococci may get into biochemical conditions which fit them for invasion of the blood, to be followed by localization in some tissues rather than in others. Persons going about with chronic, more or less latent foci of this character, consequently, are not only dangerous to themselves in that what one may call internal streptococcal metastasis may occur at any time, but they are also undoubtedly dangerous to others because they scatter about them streptococci of specialized pathogenic possibilities. Hence the efforts now made to detect and then to obliterate all forms of focal infection in the mouth and throat as well as elsewhere in the body, for preventive as well as curative purposes, besides being in accord with sound reasoning from general principles, here receive the support also of strong experimental evidence. When we consider the wide range of action of pathogenic streptococci, the great variety of disease due to their localizations in different tissues according to what Rosenow's work indicates are states of special "elective affinities," no effort should be spared that in any way will tend to reduce the supply of such streptococci and lessen the chance of infection.

At this point it may be well to recall that we owe it especially to Rosenow's work that we now understand more clearly than before the part played by streptococci in causing gastric and duodenal ulcer, cholecystitis, appendicitis, herpes zoster and erythema nodosum, as well as the joint and other infections long accepted as streptococcal in nature. In showing that streptococci cause gastric and duodenal ulcer, herpes zoster and erythema nodosum, Rosenow has broken new ground, and if future work confirms his results, particularly as to gastric and duodenal ulcer, great progress indeed will have been made. To this already formidable list of streptococcal diseases Rosenow now adds still another, namely, mumps, being careful to note, however, that the organism he finds does not seem to differ essentially from that described by Laveran, Herb and others as the cause of this disease. This raises the question whether all the organisms classed by Rosenow as streptococci will be accepted by bacteriologists as entitled to classification as streptococci. It would seem possible that some of these organisms, as, for instance, the one in mumps, may be found to be independent forms with rather constant affinities, such as illustrated by the meningococcus, for example. The fact that the organism isolated by Rosenow from mumps did not localize in the testicles is contrary to expectation, being another point that will require further investigation. Still another question, and one of fundamental importance, remains to be answered, and that is the question as to the antigenic properties of streptococcal strains of different affinities as postulated by Rosenow. Is a streptococcus that has special affinity for articular structures capable of causing the production of the same antibodies and subject to the action of the same antibodies as a streptococcus that has special affinity for the gallbladder? Or are streptococci distinguishable into a number of groups by means of immunologic reactions in the same general way as pneumococci? This question must be answered before any real advance can be made either in serum treatment or in vaccine treatment of streptococcus infections.

It is quite self-evident, so far as vaccine treatment is concerned, that for the present the free use of stock streptococcus vaccines, as advocated with unwarranted assurance by manufacturers, is not justified. The only vaccine to be used in the infections under consideration, if any, is the autogenous, that is, one made from cultures of the organism isolated from the lesion of the patient whom the physician wishes to treat with vaccine. Only by so doing will the right thing be done, because the autogenous vaccine will represent most closely in all its reactions the particular bacterial strain that is to be attacked.

WHY NOSTRUM MAKERS FAVOR SECRECY

Physicians know what the *National Druggist* stands for. For years it has championed the "patent medicine" business and for years, too, it has blackguarded the medical profession generally and the American Medical Association specifically. It is published by Henry R. Strong of St. Louis, who also publishes the *Medical Brief*. Physicians will remember at least some of the pamphlets issued by the *National Druggist* in its attempt to discredit the medical profession: "The Menace of the Dispensing Doctor," "The Machinations of the American Medical Association," "Confiscatory Legislation" and "A Conspiracy to Establish a Physicians' Trust." These were some of the tirades that emanated from this source in the nation-wide attempt to indict the medical profession.

It is not surprising, therefore, to find the *National Druggist* urging "patent medicine" makers to refuse to obey the law that is to go into effect in New York City on the last day of this year. As our readers will remember, the revised health code of New York City requires that on and after December 31, 1915, patent or proprietary medicines must either bear on their labels the names of the active ingredients, or the names of these ingredients must be deposited, in confidence, with the Department of Health. The *Weekly Bulletin* of the New York Department of Health for October 30 reprints a communication "which the publisher of the *National Druggist* is sending to druggists throughout the country." It is an interesting communication. It assumes that "the Health Board wants these formulas to be used as evidence in prosecutions under the Food and Drug laws, not only of the state and city of New York, but of the federal government as well." Being thus convinced that the ordinance is a deep plot, the communication continues:

"The medical plotters have not yet obtained a conviction in a single case under the Sherley Amendment in which the defendant has put up a fight, for *it is practically impossible to prove that the therapeutic claims made for a preparation whose composition is not known* are 'false and fraudulent.' And since they cannot obtain this information by analysis, they are seeking to inveigle the manufacturers into furnishing it themselves. Once, however, they are given the formulas, they can get as many doctors as is necessary to testify that the preparations made according thereto are not good for the diseases for which they are recommended; and suits may be brought against all who may ship their products to New York City, regardless as to where they live, and manufacturers may have to go to that city to defend themselves." [Italics ours.—Ed.]

Put in other language, the thought conveyed by the foregoing paragraph could be expressed thus: We know that most "patent medicines" are swindles and that the therapeutic claims made for them are false and fraudulent, but so long as we can keep up the element of secrecy regarding composition, the courts will have difficulty in convicting the business! The most avowed enemy of the fraudulent "patent medicine" business has never brought so strong an indictment against the trade as this one, delivered by its friend, the *National Druggist*. The communication closes with the declaration that if the New York ordinance is upheld, other cities and states will be likely to adopt similar measures with the result:

". . . manufacturers . . . will have *to give up the trade secrets* upon which the prosperity of their business depends; and more serious still, *they will be supplying evidence which may result in their own undoing.*" [Italics again ours.—Ed.]

All of which means that just so soon as the element of secrecy is removed from fraudulent "patent medicines" the manufacturers will no longer be able to keep out of jail. No wonder the nostrum interests fight the disclosure of formula. No wonder the *National Druggist* fears for its clientele.

THE LECITHINS OF MILK

The nitrogenous and phosphorized fatlike compounds described as lecithins, and more recently designated phosphatids in scientific literature, have been popularly endowed with a variety of potent virtues. In medical advertising, in particular, effects on growth and a number of tonic properties have been ascribed to these "lipoids." There is no doubt that phosphatids are widely distributed in both animal and plant tissues, and in view of this they doubtless play significant parts in various biologic phenomena. Their abundance in nervous tissue, their involvement in the structure of the blood corpuscles, their presence in large amounts in the yolk of the egg — the early nutrient of the young of certain species — point clearly to the importance of phosphatids in the functions of animals.

The question of the existence of phosphatids in milk has been answered in different ways by successive investigators. Presumably competent biochemists have affirmed, others have denied the fact of such occurrence. Even a critical, trained reader would find it difficult to form a judgment on the subject. The reason is largely centered in the methods employed. The detection of the lecithins has ordinarily been indirect in character. Extracts of milk, made with organic solvents, have been tested for phosphorus and nitrogen; and if these elements were detected in so-called "lipoidal" fractions, the presence of a phosphatid was postulated. It happens, however, that such solvents as ether do not always extract true phosphatids from animal tissues and fluids, because these compounds seem frequently to be chemically combined with other substances, such as proteins, from which they need to be liberated before they become "lipoid-soluble." Egg-yolk, for example, yields far more lecithins to the solvent ether if the material has first been treated with alcohol. The nature of these native combinations of phosphatids with proteins is as yet not understood; in any event, they are easily disrupted by so mild a treatment as boiling with alcohol. The facts may be expressed by saying that the lecithoproteins are not soluble in ether; the lecithins are soluble. It will thus be understood that the usual mode of extraction with organic solvents may or may not yield phosphatids, the outcome depending on the preliminary treatment. Hence the discrepant statements of the older literature. In plants, the phosphatids are even combined with carbohydrates in some cases. Thus the chemical problems of these lipoid compounds have become even more complex and uncertain with the progress of knowledge.

The evidence of at least two phosphatids in cow's milk has at length been definitely settled by the excellent investigation of Osborne and Wakeman[1] under

1. Osborne, T. B., and Wakeman, A. J.: Some New Constituents of Milk, First Paper, The Phosphatides of Milk, Jour. Biol. Chem., 1915, xxi, 539.

the auspices of the Carnegie Institution of Washington. Their unique success has depended on the actual isolation and identification of the compounds made possible by the utilization of hundreds of quarts of milk. One of the phosphatids thus separated contains nitrogen and phosphorus in the 1 : 1 or monamino phosphatid ratio; it yields the nitrogenous base cholin, glycerophosphoric acid and fatty acids, and otherwise resembles the typical lecithin of the textbooks. The other milk phosphatid found contains nitrogen and phosphorus in the 2 : 1 ratio, belongs to the group of diamino phosphatids, and is apparently similar to a compound of this type which has been obtained from egg-yolk, kidneys and other animal organs.

From the failure to extract phosphorus-containing residues from milk solids by treatment with dry ether, it is evident that the phosphatids are not associated with the common fats or glycerids of milk, which has frequently been assumed. Further evidence of this is furnished by the recently announced fact that butter-fat can be freed from all but extremely minute traces of nitrogen and phosphorus by purely mechanical methods.[2]

PHYSIOLOGIC ASPECTS OF SPINAL ANESTHESIA

The advent of a new and manifestly important technic in the field of clinical medicine or surgery almost presupposes a careful experimental study of its scientific aspects. Modern spinal anesthesia belongs to this category. There is a large literature already available on the clinical aspects of this type of procedure, its successes and limitations, and its advantages and disadvantages. Nevertheless the data on the fundamental responses of the organism to spinal anesthesia and their interpretation under conditions of rigid scientific critique are surprisingly meager. The situation is excellently summarized as follows: "The dangers and discomforts of ether anesthesia have long been recognized. Inevitable nausea, possible pneumonia, difficult respiration, renal injuries, make ether anesthesia impossible in certain cases, dangerous in others, and distressing in all. To meet these difficulties, spinal anesthesia was devised for use in fields where general anesthesia is superfluous, such as operations on the perineum. As a rule beneficent spinal anesthesia is nevertheless by exception open to a grave and sudden danger. In the course of surgical procedures otherwise completely successful, the vasomotor apparatus may suddenly give way. The fall in blood pressure is immediate, sometimes profound, always disquieting. Nor can the surgeon predict in what patient it may appear." [3]

It is obvious that the new method, to be completely successful and satisfactory, must suspend sensations of pain without at the same time paralyzing those regions of the spinal cord which are of importance for functions of the body which cannot well be interrupted. These include preeminently the respiratory and vasomotor responses. Vascular changes which will exsanguinate the "master cells" of the spinal bulb are certain to produce untoward results. A drug may affect the respiratory center either directly, or indirectly by lowering the blood pressure to a point where there is not enough of the circulating fluid to supply the nutritive needs and furnish sufficient oxygen to the bulb. Insufficient blood supply to other regions of the cord may affect other vital functions. It is not sufficiently realized that the vascular area of the abdominal viscera alone is so large as to make splanchnic paralysis very serious. Smith and Porter[3] remind us that the dilatation of the arteries controlled by the splanchnic vasomotor fibers may allow so much blood to enter the corresponding veins that not enough is left in the bulb and cord to support their needs. They state that a rabbit, for example, "may be bled to death into its own portal system, by section of the splanchnic nerves."

The injury to nerve cells caused by low blood pressure and consequent impaired nutrition to them depends on the low level to which the pressure falls rather than on the percental or absolute fall. The duration of the low pressure is an added factor, for nerve cells are notably sensitive to lack of nutrient surroundings. Smith and Porter,[3] at the Harvard Medical School's Laboratory of Comparative Physiology, have just published an elaborate study of the blood-pressure changes in spinal anesthesia with novocain or tropacocain. In their experiments, out of twenty subjects (animals), there was only one case in which a moderate but adequate injection in the lumbar region caused a fall of blood pressure which might have been serious. In the cases suitable for this observation, there was no paralysis of respiration after lumbar injection.

There are, however, marked falls in blood pressure. Recovery from them may take place. Of course, injections can be made so as to reduce the blood pressure very materially and paralyze the vasomotor apparatus as effectually as if the spinal cord had been extirpated. For this result one need only enter the vertebral canal at higher levels, such as the cervical region. These are of only indirect interest in a practical way, because the lower regions alone are ordinarily entered in surgery. It is important to learn that after dorsal or lumbar injection the fall of blood pressure is due to paralysis in the splanchnic area, not to involvement of the bulbar vasomotor center.

It would be almost ideal if a spinal anesthetic were found to paralyze the afferent sensory paths alone in the cord; but a strength of drug sufficient to do this will also paralyze the efferent vasomotor fibers. So far as the diffusion of the drugs used is concerned, on the whole, the bulk of the solution seemed to Smith and

2. Osborne, T. B., and Wakeman, A. J.: Does Butter-Fat Contain Nitrogen or Phosphorus? Jour. Biol. Chem., 1915, xxi, 91.
3. Smith, G. G., and Porter, W. T.: Spinal Anaesthesia in the Cat, Am. Jour. Physiol., 1915, xxxviii, 108.

Porter to be of greater importance than its strength. Dilute solutions usually, but not always, spread farther than concentrated ones. Gravity, too, is of some importance, inasmuch as tilting the animal into a head downward posture increases the diffusion of the drug. A greater fall of blood pressure occurred in the cases in which epinephrin was used in connection with tropacocain or novocain. Measures taken to raise the fallen blood pressure were of little value. It was easy to restore the pressure to normal, but the normal level could be maintained for only a few minutes.

It should be distinctly understood that these findings and conclusions represent the outcome of animal experimentation alone. They must be regarded as furnishing the key to the explanation of the most serious symptom attending spinal anesthesia, namely, the occasional serious fall of arterial pressure. Such information is the indispensable prerequisite to any rational progress in the application of the method in surgical practice. The experiments teach that spinal anesthesia can be successful only when the afferent paths are paralyzed, without at the same time paralyzing enough splanchnic cells or splanchnic root fibers to lower the blood pressure to a degree that may threaten the continued activity of the centers situated in the cervical cord and the spinal bulb.

Current Comment

"MAY WE COUNT ON YOUR ASSISTANCE?"

In the Propaganda Department this week, we print an editorial on advertising copied from the *New York State Journal of Medicine*. The conclusion is couched in strong language — but not a whit too strong:

> "When an exploiter places on the market a nostrum of no intrinsic value (excepting the bottle and cork) for which he claims virtues which it does not possess . . . he robs the purchaser of his money and health, thereby becoming a thief of the most despicable order. Any medical journal printing the fraudulent claims contained in the advertisements of the nostrums condemned by the Council on Pharmacy and Chemistry is an accessory to this act of thievery and the subscriber to such journals voluntarily assumes the position of an accomplice."

An appreciation of the subscriber's responsibility, emphasized in the editorial just quoted, may have prompted a Brooklyn physician to write us, "Cast your eye over the enclosed advertisements [from the *Therapeutic Gazette*] and then wonder at the nerve in asking subscriptions from the profession." Almost the same mail brought us, from another New York physician, a similar protest accompanied by advertisements from the New York *Medical Record*, these differing from those in the *Therapeutic Gazette* in degree but not in kind. Still another New York physician sent a collection of advertisements from the *New York Medical Journal*. Some of the advertisements sent us are of the rankest frauds, neither better nor worse than the fraudulent "patent medicine" advertisements appearing in lay periodicals — in fact, some are of "patent medicines" which many of the better lay magazines will not admit to their advertising pages. We hope that our correspondents have expressed their views on the subject to the publishers of the respective journals; nothing will so speedily bring about reform as determined and practical protest from the profession. One of the advertisements enclosed by a correspondent is pertinent here: "May we count on your assistance?" ingenuously inquires the Berlin Laboratory, Ltd., and with cool effrontery continues: "We are telling the layman about Intesti-Fermin. . . . May we count on your assistance in spreading this message to everyone. . . ?" Now who and what, doctor, may "count on your assistance?" Is it the quack and the nostrum manufacturer? Do you want to be an accomplice in what the *New York State Journal of Medicine* terms an "act of thievery"? Do you wish to assist in the promotion of Bell-Ans, Sal Hepatica, Campho-Phenique, Angier's Emulsion, Bromidia, Tongaline, Sanatogen, Sanmetto, Kutnow's Powder, Phenalgin, Micajah's Wafers, Ammonol, Chionia, Formamint, Anedemin, Neurosine, Pasadyne, etc.? If so — lend your support to the medical journals that advertise them. If, however, it is the public — your own patients — that may "count on your assistance," then your course is equally clear: refuse to accept from the mail, subscribe for, contribute to, or in any way countenance the journals that help to keep alive quackery and fraud — and *let the publishers know why!* The result will soon be evident. Do not, however, stop with this negative measure; it is equally important to sustain those journals which, without the backing of professional organization, have cleaned up their advertising pages and freed themselves from the blighting influence of the nostrum evil. If, through inertia and inattention, you permit your mail box and library table to become littered with the unclean swarm of nostrum-purveying journals, clean house. Then help support as many as you can afford of the unofficial publications that are making a creditable stand for decency in advertising. If the medical profession as a whole will manifest its opinion and desires in an unmistakable and practical way, an uplift in medical journalism will speedily be accomplished. Then and not till then can we consistently appeal to lay magazines and newspapers to stop promoting frauds in their advertising pages.

THE PUBLIC IS WAKING UP

A week or two ago we reprinted an editorial from the New York *Sun* on "The Newspaper Press as an Educator in Medicine." The editorial contains one paragraph which is peculiarly appropriate in connection with the comment given above. Here it is:

> "The *Sun* has endeavored to impress upon its readers the fallacy, if not the danger, of accepting prescriptions from doctors who, too indolent or unscientific to think out their own prescriptions, write for 'Kill or Kurem's' Hydrated Phosphate Compound, or C. D. & X. Company's 'Diostenin' or 'Professor Chadelle's Cresolated Compound,' the composi-

tion of which they either do not know at all or accept from the manufacturers. The chief aim of the latter naturally is to popularize these preparations by leaving samples at the doctor's office or offering them in generous quantities for the mere cost of a postal card. This injustice and danger to the lay patient will never be removed, because the medical journals with but a very small exception advertise these preparations, the value and uses of which the manufacturers, with the most brazen effrontery, offer to teach the doctor who will listen."

How many times THE JOURNAL has said the same thing. It is encouraging to see that the newspapers are helping to reform the medical profession in this regard. When the average layman wakes up to the fact that his doctor is prescribing a "patent medicine" — for the average layman will not be able to distinguish between many of the so-called "ethical proprietaries" and the common, every-day "patent medicine," any more than we are able to do so — he will either go to a doctor who will give him the benefit of scientific training and individual thought, or he will go to the druggist and purchase his own medicine and read for himself what the manufacturer has to say regarding it.

ASEPSIS AND THE DISH TOWEL

Among the low-priced restaurants and lunch rooms which are numbered by hundreds in our large cities, there is one (it is but a type—there are dozens like it) whose exterior of white brick and plate glass is as sparkling and bright as a newly frosted cake. Within, an expanse of white enamel, resplendent metal and spotless linen proclaims a devotion to cleanliness rivaled only by the surgical ward in a hospital. The waitresses are as neat and trim as uniformed nurses. In this stainless temple of alimentation one of the immaculate priestesses has been seen to pick up a glass just used by a departing guest, polish it with the dish towel at her belt, and calmly replace it on the table to be used by the next patron! One might instance even more horrifying infringements on prandial decency in more pretentious establishments; one might expatiate on the possible dangers of infection from such practices. The establishments do not lose custom thereby, probably because the public, while vaguely impressed with the beautiful ideal of asepsis or perfect cleanliness, has a pathetically inadequate idea of what it means. It is therefore encouraging to read the following, under the heading "The Mischievous Wiping Cloth," in the November issue of the *Journal of Home Economics*:

> The dish towel, even the genteel barred variety, called a tea towel, is in bad repute. Ever since men began to look through the microscope and think in terms of the microscope its fate has been sealed. Only when freshly washed and boiled and used in clean hands to wipe the rims of already scalded and drained dishes is it to be admitted into a modern kitchen. Used in dirty hands till grimy, carried on the arm of a waiter and used to polish a plate or wipe up a table, it belongs to the dark ages, hygienically speaking. In dish washing the household should more and more approach the practice of the laboratory where glassware and porcelain are washed, rinsed in boiling water and placed to drain. No cloth, no matter how well known its antecedents, is allowed to touch them, for they are now absolutely clean and must remain clean.

Perhaps, if such ideas as these are becoming current, we may hope for the day when Bridget will invariably sterilize her dish cloth and scorn the dish towel for her aseptic dishes, while "neat-handed Phillis" will always complete her coiffure beyond all revision before coming to serve our food. At any rate, one may always hope.

THE "CHEMICAL" WAR

The present war has been frequently called — not inaptly — a "chemical war" because so many of the destructive energies at work are due to modern advances in chemistry, particularly in our knowledge of the nitrogen compounds.[1] This designation has seemed, perhaps, a slur on the science of chemistry. It has even been hinted that chemistry is more harmful than beneficial, and that its development represents a serious detriment to mankind. In an address presented at the meeting of the American Chemical Society at Seattle, Dr. L. H. Backeland[2] discusses some of these imputations. This is by no means the first "chemical" war. The art of killing and robbing became chemical the day gunpowder was invented, how long ago we are not quite sure; but it is certainly over 1,000 years ago and perhaps nearer 2,000 years ago. Napoleon, over 100 years ago, was probably the first to recognize that chemistry and the related sciences might be used to great advantage in giving him decided advantages over his enemies. Incidentally he thus helped to lay the foundation for some important branches of chemical industry. It was not very long, however, before his enemies learned the lessons of chemistry, and he is reported to have stated that "the dogs have learned something from us." The perversion of chemistry to military uses has been only a side issue. Some of the most important advances in military methods have originated in some of the most beneficent steps in progress made by chemistry. Dr. Backeland insists emphatically that it is not fair to reproach chemistry with "the fact that nitrocellulose, of which the first application was to heal wounds and to advance the art of photography, was stolen away from these ultrapacific and highly laudable purposes for making smokeless powder and for loading torpedoes." Nor is it fair to blame the chemist for the fact that phenol, which in Lister's hands revolutionized surgery, was turned from a blessing to humanity into a fearful explosive after it had been discovered that nitration changes it into picric acid. Curiously enough, many of those who have been engaged in diverting or perverting chemical compounds from usefulness in peace to the greatest destructiveness of war have been convinced that this very destructiveness from its awful character would produce an inevitable reaction which would guarantee peace. Alfred Nobel, the founder of the world peace prize, was a manufacturer of dynamite and made a fortune in high explosives. He fondly hoped that these high explosives

1. The Artificial Fixation of Atmospheric Nitrogen, editorial, THE JOURNAL A. M. A., Sept. 25, 1915, p. 1112.
2. Backeland, L. H.: Applied Chemistry, Science, Oct. 22, 1915, p. 547.

would make war so destructive as to put an end to it forever. The old Romans had a maxim that from the abuse of a thing no argument was valid against the use of it. Chemistry has been an immense boon to the human race, even though at times its misuse has led to some of the worst calamities of human history.

THE RÔLE OF THE THYROID IN IMMUNITY

A number of observations have been made in order to determine what rôle, if any, the thyroid plays in immunity. Fassin recorded a diminution in the hemolytic and bacteriolytic properties of the blood after thyroidectomy, and Marbé found that the opsonic and phagocytic powers suffer, while Frouin declared that in dogs there was no loss of antitoxin, although the alexin was diminished. Lerda and Diez found that guinea-pigs are about as resistant to tetanus toxin without the thyroid as with it. Fjeldstad did not observe any interference with the formation of typhoid agglutinins after thyroidectomy in guinea-pigs. Most recently Launoy and Levy-Bruhl[1] have studied the problem in question, using an animal that heretofore has not been made the subject of experiments in this particular direction. These investigators were unable to make out that the removal of the thyroid in the chicken had any effect whatever on the course of a spirochetal infection (spirochetosis gallinarum). In view of the part played by the thyroid in maintaining the health of the body, it would not be surprising if disturbances of the function of this gland should be found to favor the development of infection, if not by direct interference with the formation of antibodies, then in some more or less indirect manner, such as disturbances of the functions of the leukocytes. As shown by this review of experimental work, the results obtained are not in agreement—a circumstance which is not so remarkable when we consider the variety of animals and methods employed. Much more work is required before the question as to the exact rôle of the thyroid in the resistance to infection will be settled. Under any circumstances the results obtained so far do not warrant the direct association of the thyroid with the production of antibodies.

1. Launoy and Levy-Bruhl: Ann. de l'Inst. Pasteur, 1915, xxix, 213.

State Control of Sewerage Systems.—The Maryland act of 1914 empowers the State Board of Health to order local authorities to install public systems of water supply, sewerage or refuse disposal in any municipal division of the state whenever the absence or incompleteness of such systems was sufficiently prejudicial to the health or comfort of the community. The local authorities might if they deemed any such order unlawful, unreasonable or unnecessary, bring an action in the courts to set aside the order. In October, 1914, the State Board of Health ordered the county commissioners of Baltimore County to install a sewerage system in a specified area. The commissioners sought in the courts to have the order set aside. They attacked the constitutionality of the law, but did not allege that the order was unreasonable. The supreme court of the state held that the sections of the act attacked were constitutional, but sent the case back to the circuit court to have determined the reasonableness of the order.

Medical News

(Physicians will confer a favor by sending for this department items of news of more or less general interest; such as relate to society activities, new hospitals, education, public health, etc.)

DISTRICT OF COLUMBIA

Home from Serbia.—Dr. Louise Taylor Jones, who has been serving in Serbia with the Red Cross, landed in Boston, October 21.

Measures for Health.—The Public Health Committee of the Board of Trade, in its annual report, has made health recommendations as follows: an appropriation to permit the erection of the proposed municipal hospital; the establishment of dental clinics in connection with the work at all local hospitals; improvement of ventilation in street cars; the establishment of an institution for idiotic, imbecile and feebleminded children; legislation for voluntary commitment for the Government Hospital for the Insane; the provision of a medical psychologist for every reformatory in the District; the erection of public baths in the various schools of the city; the establishment of a hospital for inebriates; the appointment of additional inspectors, the provision of increased laboratory facilities in the health department, and the erection of additional underground public comfort stations.

ILLINOIS

Personal.—Dr. Emmett A. Garrett has been appointed health commissioner of Peoria to succeed Dr. Edward Hasson.——Dr. J. W. Allison, Essex, who was operated on October 29 at Rochester, Minn., for the removal of gallstones, is reported to be doing well.——Dr. C. St. Clair Drake, secretary of the State Board of Health, Springfield, has returned from a trip to the Pacific coast.——Dr. Robert C. Bourland, Rockford, is convalescing from an attack of diphtheria.——Dr. Harrison R. Rogers, Rockford, was operated on for appendicitis in the Presbyterian Hospital, Chicago, October 30, and is said to be doing well.——Dr. William G. Bechtold, Breeze, who has been under treatment for tetanus in St. Elizabeth's Hospital, Carlyle, is reported to be improving.——Dr. James A. Kleinsmid, Aledo, who has been seriously ill as the result of an automobile accident, early last month, is now convalescent.——Dr. Barker Althunian, Joliet, has sailed for Europe, November 3, to work with the Russian Red Cross.

Chicago

Correction.—Dr. Oscar Dodd has been elected president of the Illinois Charitable Eye and Ear Infirmary Alumni Association, and not the Illinois Charitable Eye and Ear Infirmary as erroneously stated in the issue of October 30.

Meeting of Gynecologists.—At the thirty-seventh annual meeting and dinner of the Chicago Gynecological Society October 15, the following officers were elected: president, Dr. Channing W. Barrett; vice presidents, Drs. Franklin H. Martin and Mark T. Goldstine; secretary, Dr. N. Sproate Heaney; treasurer, Dr. Charles B. Reed; editor, Dr. W. A. Newman Dorland, and pathologist, Dr. Arthur H. Curtis.

To Prosecute Quacks.—Thomas S. Hogan of Chicago has been appointed special state's attorney in Cook County to handle violations of the medical practice act prosecuted by the state of Illinois. Mr. Hogan held the appointment of official counsel to the State Board of Health until the position was abolished by a decision of the supreme court. The court decision which in effect abolished the position held by Mr. Hogan with the state board, placed in jeopardy all pending prosecutions against quacks. The appointment had the approval of Governor Dunne.

Institute of Medicine Organized.—The Institute of Medicine of Chicago, the purpose of which is stated to be the encouragement of the advancement of medical science, was organized formally at a dinner at the Hotel La Salle, November 5, which was attended by 150 charter members of the organization. The officers elected were as follows: president, Dr. William E. Quine; vice president, Dr. Ludvig Hektoen; secretary, Dr. John G. Wilson; treasurer, Dr. J. A. Clapp; and board of governors, Dr. Frank Billings, chairman, William Allen Pusey, E. Fletcher Ingals, and William

H. Wilder. The objects of the organization are similar to those of the College of Physicians of Philadelphia, the Academy of Medicine of New York City, the Boston Medical Library, etc. It will conflict with no other medical organization. One of the immediate objects will be the securing of a permanent home for the medical profession of Chicago and vicinity.

INDIANA

Pure Food Violators.—A new policy has been adopted by H. E. Barnard, state food and drug commissioner, who declares that any saloon that violates the pure food law of Indiana and refuses to abide by the orders of the pure food bureau will be closed up the same as a restaurant that refuses to obey the law.

Mural Decorations for Hospital.—The mural decorations for the new Burdsal wing of the City Hospital, Indianapolis, have just been completed by William E. Scott, a colored artist. The work has required many months and is regarded as the most successful which the artist has done in this line. The subjects for the women's ward were "The Four Seasons" and "Nations Coming to Light." For the obstetrical ward Mr. Scott chose the subject of the life of Christ. Three hundred figures were used on twenty-two panels, varying in width from five to forty feet.

The Dispensary and University Trouble.—For several years the board of health of Indianapolis has contracted with the School of Medicine, Indiana University, so that there would be but one free dispensary in Indianapolis, in place of the former City Dispensary and the Bobbs Dispensary at the college. The board of health, however, reserved to itself the right to conduct and supervise this joint dispensary and also the power to discharge all employees and officers. The board of health paid the Medical College $915 a month for its share of the expenses to the dispensary, the college paying the balance, which amounted to nearly $300 per month. Various breaches of the contract recently, although the contract has but two more months to run, have caused the board of health to discontinue its support to the Medical College and to refuse to admit the medical students to the City Hospital. A new city dispensary has been opened at the City Hospital and the staff, officers and employees of the previous joint dispensary are all taken care of in the new dispensary. At the present time the only clinical facilities open to the students of the Medical College are those at the Long Hospital, which has very few patients compared to the City Hospital. A mass meeting of the students was held November 5, to ascertain what the faculty intends to do in regard to furnishing them with clinics. Nothing definite has been done concerning the solution of this problem.

IOWA

Branch Laboratories Established.—Branch laboratories of the State Bacteriologic Laboratory have been established at Davenport and Waterloo. The work of these branches will be superintended by Dr. Henry Albert of the University of Iowa, Iowa City.

Pathological Laboratory Incorporated.—Articles of incorporation of the Davenport Pathological Laboratory were filed with the Scott County recorder, November 2. The organization is not for profit and the officers are as follows: president, Dr. Henry U. Braunlich; secretary, Dr. William A. Stoecks, and treasurer, Dr. Anthony P. Donohoe.

Personal.—Dr. James M. Brooks, Newell, has been made a life member of the Buena Vista County Medical Society. ——Dr. Hobart E. Martin, Clinton, who was operated on for hernia at Mercy Hospital, October 21, is reported to be doing well.——Dr. Edward J. Van Metre, Tipton, was seriously injured by the overturning of the automobile in which he was riding, near Tipton, October 9. His collar bone and three ribs were fractured.

MARYLAND

Medical Societies Merge.—The medical societies of the University of Maryland School of Medicine and the College of Physicians and Surgeons were merged at a special meeting of a committee appointed by the combined faculties, recently. Since the combination of the two schools of medicine has become permanent, it was decided that a single medical society representing both schools would bring about the best results. Dr. Albert H. Carroll was elected chairman of the new society, Dr. Elmer B. Freeman, vice chairman, and Dr. Alexius McGlannan, secretary.

Personal.—Dr. Karl H. Van Norman, first assistant superintendent of Johns Hopkins Hospital, has resigned to accept a captaincy in a Canadian regiment, which is soon expected to be assigned to active duty.——Dr. William B. Hunter, Baltimore, superintendent of Kernan's Hospital and Industrial School for Crippled Children, has resigned, to take up private practice in Wilmington, N. C.——Dr. John D. Fiske, Baltimore, who is employed by the Atlantic Transport Company, while climbing a ladder up the side of a ship, slipped and fell 20 feet, breaking his shoulder.——Dr. Leonard G. Rowntree, assistant head of the department of medicine of Johns Hopkins University, has been appointed professor of medicine and chief of the department in the University of Minnesota, succeeding Dr. Charles Lyman Greene, St. Paul, resigned.——Dr. C. Hampson Jones assumed his duties as chief of the bureau of communicable diseases of the State Department of Health, November 4.——Dr. William Travis Howard, Jr., became assistant commissioner of health of Baltimore, November 4.——Drs. Lewis C. Spencer and Martillus H. Todd of the staff of American surgeons at the Pau Base Hospital, France, returned to Baltimore, October 26. ——Dr. Marshall B. West, Catonsville, is reported to be ill with septicemia.

MINNESOTA

New Bi-County Sanatorium.—On October 18, work was commenced on the Clay-Becker County Tuberculosis Sanatorium at Sand Beach Lake. The cost of the construction of the sanatorium will be about $45,000 and it is to be completed about July 1, 1916. The building will be of brick and reenforced concrete, three stories in height and will accommodate about twenty-five patients.

Personal.—Dr. James F. Hammond, St. Paul, who has been in service on the Gallipoli Peninsula, returned to London in charge of wounded soldiers, September 23, and after a short stay, returned to the Mediterranean.——Dr. William J. Mayo and party ended their cruise on Dr. Mayo's steamer *Oronoco*, at Louisville, October 23, and returned to Rochester by rail. The trip included the Mississippi River from Winona, Minn., to Cairo, Ill., the Ohio and Cumberland rivers as far as Rome, Tenn., and then the Ohio River to Louisville, Ky., where the cruise ended.——Dr. William J. Mayo, Rochester, has been elected president of the Good Roads Organization for Olmstead County which was organized recently.——Dr. Delbert F. Dumas, Cass Lake, has sold the Cass Lake Hospital to Dr. Samuel R. Fraker, Chelsea, Iowa.——Dr. James A. Rippert, Chisholm, lectured before the senior class of the University of Minnesota Medical School, October 27, on "Medical Supervision in Public Schools."

Whole-Time Men in Health Service.—A report of the public health committee of the Minnesota Public Health Association contained the following comment on the reorganization of the health service in Minneapolis, St. Paul and Duluth: Minneapolis is talking of employing several whole-time men and having a complete reorganization of the department, to be effective about Jan. 1, 1916. It is hoped that the talk will materialize into something definite. Outside of their visiting nurse service, and in Duluth the milk inspecting service, the health departments of the three large cities of the state have nothing worth commenting upon. A rating of efficiency of organization by the federal department would be disgraceful to the state of Minnesota. In spite of a lack of organization, poor facilities and inadequate pay, the men in charge of the departments in the three cities are doing excellent work. In all three, Minneapolis, St. Paul and Duluth there should be a complete reorganization with the employment of whole-time men trained in public health work.

MISSISSIPPI

State Board of Health Wants Sanatorium.—The State Board of Health has appointed a committee composed of Drs. Waller S. Leathers, University; L. Wade Glass, Lyon; Harvey F. Garrison, Seminary; James J. Haralson, Forest, and Daniel J. Williams, Gulfport, to draft a bill to be presented to the next legislature, asking for the creation of a state sanatorium for tuberculosis.

Health Day.—Pursuant to a proclamation by Governor Brewer, dated September 14, October 29 was set apart as Health Day at the request of the state educational department. Programs were carried out on that day in the public schools and a six-months' campaign of education prepared by the State Board of Health and the department of education was inaugurated.

MONTANA

Medical Inspection.—The school board at Bozeman has accepted the proposition of the Gallatin County Medical Society to establish medical inspection in one school in Bozeman. The society by resolution agreed to furnish medical inspection for one of the smaller schools of the city and to give detailed report of such inspection to the board of trustees without making any charges. The Hawthorne School has been selected. Bozeman has not heretofore had medical inspection of schoolchildren.

Personal.—Dr. John W. Frizzell, Great Falls, fractured his leg while cranking his automobile, October 18, and also received internal injuries when the car started, crushing him between the car and the garage wall. He is reported to be in a critical condition at the Deaconess Hospital, Great Falls. ——Dr. Charles F. Jump, Bozeman, has returned after postgraduate work in Chicago.——Dr. Willoughby G. Dye, Deer Lodge, has gone to Boston for postgraduate work in Harvard Medical School.——Dr. William L. Renick and Dr. Thomas C. Witherspoon of Butte have recently purchased the ranch of the late Dr. Robert P. R. Gordon, Great Falls, on the Swan River, in the vicinity of Swan Lake. The ranch will be used as a summer residence.——Dr. Herbert H. Judd of Bozeman addressed the Woman's Club at Livingston, November 3, on medical inspection of schoolchildren.

Medical Attention Under Compensation Act.—The attorney-general has given the following opinion to the State Accident Industrial Board regarding medical attention under the provisions of the workmen's compensation act:

"Whenever an accident occurs and no loss of time results to the injured employe, and the nature of the resulting injury is such as to make it reasonably necessary to secure medical service, attention or medicines, or to give care, attention or treatment to the injured employe, the employer, insurer or industrial accident fund, as the case may be, depending upon the plan adopted by the employer, is liable for the reasonable and necessary expenses incurred for such medical services, attention or medicines, not exceeding in any one case the sum of $50, and not extending over a period of more than two weeks immediately following the accident."

NEBRASKA

Personal.—Dr. John A. Waggener, Humboldt, has been appointed physician to the Soldiers' and Sailors' Home, Grand Island.——Dr. Volney D. Douglas, Crab Orchard, was severely injured by an axe wound of the knee, October 10. ——Dr. Adrian F. Burkard, Omaha, has moved to Soquel, Calif.——Dr. William R. Peters, Stanton, while returning from a professional call, recently, was seriously injured by the overturning of his automobile.

Contagious Disease Hospital for Lincoln.—Following a visit to the Isolation Hospital of Lincoln by a special committee from the Lancaster County Medical Society, the committee has recommended that another hospital for the treatment of contagious diseases be built. Under the present system there is no provision for the care of patients suffering with diphtheria and scarlet fever and the isolation hospital is used chiefly for smallpox. The plan of the committee is to erect a small cottage some distance from the isolation hospital, for the treatment of other communicable diseases.

NEW YORK

Vassar Alumnae Ask Health Work.—Twelve young women, members of the Buffalo Chapter of the Vassar College Alumnae Association, have requested the deputy health commissioner to assign them to work in connection with the extension of the health center movement.

Health Centers for Buffalo.—Health Commissioner Fronczak announces that he intends to designate Dr. Nelson G. Russell as chief consulting physician for Buffalo. He has also decided to inaugurate three additional health centers, one at 1067 Grant Street, one at 591 William Street and a third on the grounds of the Municipal Hospital at 770 E. Ferry Street. The entire scheme is merely a rearrangement and readjustment of the territory now covered by the staff of the health department. The following physicians have been appointed by Dr. Russell to take charge of the tuberculosis work: Dr. James H. Donnelly, chief examiner; Dr. David Cohn, examiner at the Municipal Hospital health center; Dr. George J. Eckel, examiner at the East Buffalo center, and Dr. Harry Mead, examiner at the Black Rock center.

New York City

Home for Cancer Patients.—The new House of Calvary on Macomb's Road in the Bronx, erected at a cost of $120,000, has been formally opened by Cardinal Farley. This home for the cancerous poor was founded many years ago in Perry Street by Adrian Iselin, and was later moved to upper Seventh Avenue.

Personal.—Dr. and Mrs. W. Seaman Bainbridge and Dr. John Van der Poel have returned from Europe.——Dr. Clarence A. McWilliams sailed for France, November 3, to take charge of the French Military Hospital at Passy.——Dr. W. J. Maloney, who was wounded by shrapnel while serving with the Red Cross at the Dardanelles, reached New York on the *St. Louis*, October 31.

Violations of the Drug Law.—A report just made by District Attorney Wilmot shows that since the first of the year there have been 700 convictions in the court of special sessions of persons selling and possessing drugs. This number, however, does not include the many thousand addicts who have been committed by magistrates to hospitals for treatment. Among those convicted there have been fifty druggists and a number of physicians. The report states that the sale of habit-forming drugs has been greatly decreased because of the crusade of the district attorney's office.

Health Department Again Warns Traction Companies.—Dr. Haven Emerson, who has just succeeded Dr. Sigismund Goldwater as health commissioner of New York City, has declared his intention of carrying out Dr. Goldwater's policies. One of his first steps along this line has been to send a notice to the car companies that the order issued by Dr. Goldwater last March calling attention to that section of the city charter which forbids overcrowding is still in effect and that inspectors will begin to ride on the cars shortly and count passengers.

NORTH CAROLINA

Hospital News.—Mrs. Edith Vanderbilt, widow, and W. K. Vanderbilt, executor, of the late George W. Vanderbilt, have executed a deed to the Clarence Barker Memorial Hospital on the site now occupied by the Biltmore Hospital and Dispensary. The deed proposes that the hospital be used continuously for hospital and dispensary purposes for thirty years and that otherwise it shall revert to the estate of the late George W. Vanderbilt.——St. Luke's Hospital, New Bern, has been completed and was formally opened November 1 for public inspection. On the next day the hospital was ready to receive patients.

Personal.—Dr. Herbert H. Purinton, Durham, has been appointed by the British government, health officer to the Leeward Islands, British West Indies, and has left for his new post of duty.——Dr. C. Banks McNairy, superintendent of the State School for Feebleminded, Kinston, was severely injured in an encounter with an enraged bull on the farm attached to the school.——Drs. Watson S. Rankin, Raleigh, secretary of the State Board of Health, and Thomas M. Jordan, Raleigh, have returned after a tour of school inspection systems in eastern cities. Dr. Jordan started on the school inspection work for the State Board of Health, November 1.——Dr. R. H. Crawford, Rock Hill, has returned from service with the American Red Cross in Germany and Austria.

OHIO

Tuberculosis Hospital Donated.—Peter Kuntz, Dayton, has purchased a site for the proposed tuberculosis hospital which he will erect for the use of the people of Dayton at a cost of $500,000. The site selected is on the highlands west of the city.

Western Reserve News.—President Charles F. Thwing of Western Reserve University in his annual report renews a recommendation that a fund be established to take the name of the late Dr. Hunter H. Powell, a distinguished member of the faculty of the school of medicine. To the $40,000 which is expected will be set aside for this fund, President Thwing said that $10,000 may fittingly be added.——He also asks that a special fund be set aside from the $1,000,000 donation to the school of medicine under the name of Dr. Dudley P. Allen, the income of this fund to be used in research in surgery.——The delay in rebuilding the Western Reserve School of Medicine and Lakeside Hospital is contributed to by the "commercial and industrial depressions and uncertainties caused by the European War."

Personal.—Dr. Charles L. Files, Van Wert, who has succeeded Dr. John R. Johnson as superintendent of the District Tuberculosis Hospital, Lima, assumed the duties of his new position, November 1.——At the quarterly meeting of the council of the State Medical Association held in Columbus,

October 25, Mr. George V. Sheridan was unanimously elected executive secretary of the organization.——Dr. Joseph G. Fudge, Spring Valley, was seriously burned by the explosion of an acetylene tank, October 23.——Dr. James G. Cullen, Toledo, is reported to be critically ill.——Dr. John N. Calhoun, Lisbon, is reported to be ill with nephritis in Lakeside Hospital, Cleveland.——Dr. Edwin A. Hamilton, Columbus, has returned after four months' Red Cross service in Gleitwitz, Germany.——Dr. Philip D. Wilson, Columbus, has returned after military hospital service in France.——Dr. Charles H. Ross, Alliance, was knocked down by a motorcycle, October 11, fracturing his right leg below the knee.——Dr. Cassius M. Shepard, Columbus, who was operated on for appendicitis, October 2, has made a satisfactory recovery.——Dr. Howard W. H. Nelles has been elected chief of staff and Dr. Joseph J. Sweeney, secretary of the Lucas County Hospital, Toledo.——Dr. Charles G. Souder, has been appointed superintendent of the Lucas County Tuberculosis Hospital, Toledo.

PENNSYLVANIA

Cornerstone Laid.—The cornerstone of the new Children's Building of the Tuberculosis League Hospital, Pittsburgh, was laid by Dr. Samuel G. Dixon, commissioner of health of Pennsylvania, October 29.

State Hospital Officials Meet.—At a meeting held in Philadelphia the week of October 29 of the trustees and superintendents of state and incorporated hospitals for the insane and feebleminded of Pennsylvania, the following officers were elected: president, William M. Donaldson, Harrisburg; vice president, Dr. Harry W. Mitchell, Warren; and secretary, Dr. Henry I. Klopp, Rittersville.

Personal.—Dr. Benjamin Frye, Sharpsville, who has been seriously ill with diphtheria, is reported to be much improved.——Dr. J. Burket Howe, Erie, underwent an operation October 18 and is reported to be doing well.——Dr. Clinton T. Saylor, Rockwood, who was operated on for appendicitis at a hospital in Johnstown recently, is convalescent and will soon resume practice.——Dr. Fremont W. Frankhouser, Reading, who has been incapacitated for some time on account of an automobile accident and then by reason of an operation on the eyes, has recovered and resumed practice.——Dr. Michael George Dewey, Girardville, was seriously injured in an automobile accident, October 12.——Dr. Theresa G. Breene Baum, Oil City, is reported to be critically ill.——Dr. Francis E. DeLong, Bayers, was seriously injured, October 2, by being thrown from his buggy in a runaway accident.

Philadelphia

Personal.—Dr. Frank R. Starkey has returned from a five months' tour of North America and has resumed practice.——Dr. Ray Parker of the Philadelphia Hospital for the Insane has resigned to accept an appointment as first assistant at the State Hospital for the Chronic Insane, Wernersville, where she will succeed Dr. Robert M. Alexander, resigned to enter private practice in Reading, Pa.——Dr. Horatio Connell Jones underwent an operation in the Samaritan Hospital, October 29.——Dr. Bertha Whaland and Dr. Ann T. Gibson have been appointed assistant medical school inspectors by Director Ziegler.

Hospital Wins Suit.—Judge Gummey in the Orphans Court, November 3, awarded to the Episcopal Hospital a bequest of James J. Hope for the establishment of a ward in a hospital devoted to the treatment of contagious diseases. The bequest was frequently referred to as a fifty-thousand dollar legacy, but, according to the adjudication, it amounts to $18,924.90. In January the legacy was awarded to the Philadelphia Hospital for the treatment of contagious diseases and was later set aside and all hospitals invited to submit evidence. Upon the testimony of trustees of the Episcopal Hospital that they intended to alter their buildings for the purpose of treating contagious diseases, the new award was made.

VIRGINIA

Hospital Notes.—The contract between the Abingdon Hospital and the Board of Supervisors of Washington County has been renewed for one year.——The William A. Crowder Memorial Hospital, Petersburg, was formally opened the first week in October.

Washington County Physicians Organize.—Physicians of Washington County met at Bristol, October 22 and organized a medical society with an initial membership of fourteen and the following officers were elected: president, Dr. Andrew F. Horne, Glade Spring; vice presidents, Drs. D. L. Kingsoliver, Green Springs; William L. Gannaway, Abingdon, and W. H. Teeter, Barytes; and secretary, Dr. Paul Kernan, Bristol.

Tri-County Medical Society Organized.—Physicians of King George, Stafford and Spotsylvania counties and the city of Fredericksburg met October 19 at Fredericksburg and organized the Tri-County Medical Society, electing the following officers: president, Dr. William A. Harris, Spotsylvania; vice presidents, Drs. Joseph N. Barney, Jr., Fredericksburg, and Henry W. Patton, Hemp, and secretary-treasurer, Dr. C. Mason Smith, Fredericksburg.

New State Society Officers.—At the forty-sixth annual meeting of the Medical Society of Virginia, in Richmond, October 26 to 29, the following officers were elected: president, Dr. Joseph A. White, Richmond; vice presidents, Drs. Marshall J. Payne, Staunton; Edward E. Feild, Norfolk, and Robert M. Wiley, Salem; treasurer, Dr. Mark W. Peyser, Richmond (reelected); secretary, Dr. Paulus A. Irving, Farmville (reelected); delegates to the American Medical Association, Drs. Southgate Leigh, Norfolk, and William E. Anderson, Farmville; Dr. Edwin L. Kendig, Victoria, councilor from the Fourth District; and Dr. John Staige Davis, University, councilor at large. Norfolk was selected as the next place of meeting.

Antituberculosis Work.—The executive secretary of the Virginia Antituberculosis Association in her annual report states that during the year sixty-five lectures were given in sixteen counties of the state. That in six counties, county societies have been formed and that at present sixteen active leagues or committees are at work in the state. Danville has opened a fresh-air school. The association received from the sale of Christmas seals, $3,886.—— The Tuberculosis Sanatorium on Reservoir Hill, which is being erected by the Danville Antituberculosis Society and the city of Danville, is practically ready for occupation. At present there are two tuberculosis patients in the camp who have been occupying tents for several months and are showing great improvement.

CANADA

Personals.—Dr. Harold C. Sutton, Cooksville, Ont., has joined the Canadian Army Medical Corps.——Dr. R. W. Bruce Smith, Toronto, inspector of the provincial hospitals for the insane for Ontario, who has been ill since last spring, is now reported to be recovering rapidly.——Dr. J. Arthur Sutherland, who since his graduation from Trinity University in 1896, has been practicing in British Columbia and Fairbanks, Alaska, was in Toronto in October on his way to go into service with the French Army Medical Corps.——Lieut.-Col. Walter T. Connell, Kingston, Ont., on duty with Queen's Stationary Hospital in Egypt, has sailed for Canada.——Dr. Alfred W. Nixon, M. P. P., Georgetown, Ont., has volunteered for active service and has been accepted. He will leave shortly for England to join the R. A. M. C.——Dr. Vernon Lamb, St. Andrews, N. B., is at present attached to the Canadian Cavalry depot at Shorncliffe, England, having 1,500 men in his charge.——Dr. Thomas G. Brodie, University of Toronto, recently returned from England, after a summer with the University of Toronto Base Hospital.——Dr. Darius A. Coon, Elgin, Ont., has resigned as superintendent of the Kingston General Hospital and will enter private practice in that city. He has been succeeded by Dr. M. F. Coglan.——At Woodstock, Ont., November 5, the members of the medical profession of that city gathered at the residence of Dr. A. Beverley Welford to do honor to five of their confrères who had entered the army medical service. All were presented with wrist watches. Capts. Franklin S. Ruttan and Samuel M. McLay are at the front; Capts. David J. McKay, J. McKenzie Cochrane and Jim B. Jupp are in training.——Six doctors have been selected in Toronto to reinforce the Canadian Army Medical Corps. They are: Dr. G. A. Wallace, Bellevue Hospital, New York; Dr. Karl H. Van Norman, Baltimore; Dr. Roy H. Thomas, Toronto; Dr. Albert J. Fisher, New Liskeard; Dr. John Hunt, Sault Ste. Marie, Ont.; Dr. Reginald A. Mathews, Toronto.——Major Frederick Guest, R. A. M. C., St. Thomas, Ont., is home on short leave of absence necessitated by an accident. He will return to the Dardanelles in two months. There are no Canadian troops where he was stationed, at West Mudros on Lemnos, Greece.

GENERAL

Hospital Ship for Fishing Banks.—The Coast Guard Cutter *Androscoggin* has left the Charlestown Navy Yard for Gloucester, Mass., preparatory to a cruise to the Banks of New-

foundland and the coast of Nova Scotia where it will act as hospital ship for the fishing fleet.

Surgeons' Congress at Boston.—At the annual meeting of the Clinical Congress of Surgeons in Boston, the following officers were elected: president, Dr. Fred B. Lund, Boston; vice presidents, Drs. Jasper Halpenny, Winnipeg, Man., and Samuel M. D. Clark, New Orleans; general secretary, Dr. Franklin H. Martin, Chicago (reelected); and treasurer, Dr. Allen B. Kanavel, Chicago (reelected). Philadelphia was selected as the next place of meeting.

Vaccination Regulation Rescinded.—It is reported that Secretary of Commerce William C. Redfield has ruled that the provisions of the new seaman's act relative to vaccination within a period of five years before a certificate of competency will be issued to a seaman, need not be enforced. The seaman's law went into effect November 4, and the designated stations for physical examination of applicants have been crowded with seamen applying for certificates. The physical examination required by the law is a rigid one. The reason for Secretary Redfield's ruling has not been disclosed, so far as known.

Cancer Cultures.—To provide against contingencies that might be brought about by the Zeppelin raids on London, Dr. James A. Murray, director of the Imperial Cancer Research Fund, several weeks ago sent to the Columbia University laboratory in New York duplicates of all the cultures and specimens that have been developed in London through thirteen years of patient work by the fund. A recent Zeppelin raid narrowly missed causing the destruction of the laboratories in London. The specimens sent to New York were placed in charge of Dr. Francis Carter Wood, director of the Crocker Cancer Research Fund of Columbia University, and will remain there indefinitely unless those in London should be destroyed. The Crocker Fund and the Imperial Research Fund are in close communication and have exchanged scientists on occasion.

Seize Substitute Specifics.—Several shipments of worthless imitation drug products have been seized by the officials in charge of the enforcement of the Food and Drugs Act. A preparation put up in imitation of neosalvarsan is being distributed to drug stores in this manner. A sample labeled "Neosalvarsan," which was recently examined by the department, was found to be nothing more than salt colored with a coal tar dye, none of the genuine neosalvarsan whatever being present. The label on this product was an exact reproduction of the genuine imported neosalvarsan, or it was an original container refilled with the imitation articles. Other preparations peddled to druggists and purporting to be acetylsalicylic acid, or aspirin, have been seized by officials in charge of the enforcement of the Food and Drugs Act, because an analysis showed that the products were worthless imitations.

Metabolism Investigation Assistant Wanted.—The United States Civil Service Commission announces an open competitive examination for assistant in metabolism investigations, for men only, on December 8, at the usual places in the United States at which such examinations are held. From the eligible list certification will be made to fill the vacancies in this position at the United States Public Health Service for field duty at a salary of $1,500 a year. The prerequisites are, graduation after a four years' course at a university, college or medical school of recognized standing; at least six months' practical experience in work with the respiratory apparatus and the calorimeter; verification of statements as to education and experience, and age, below 45 on the day of examination. Application for those who take this examination is to be made to the United States Civil Service Commission, Washington, D. C., or the secretary of the local board.

Bequests and Donations.—The following bequests and donations have recently been announced:

Johns Hopkins University, $37,500, to be invested under the name of the Beal Memorial Fund, the income to be used at the discretion of the Board of Trustees; Eudowood Sanatorium, Towson, Md., $10,000, by the will of James M. Beal.

Kansas University School of Medicine, Lawrence, $30,000, by the will of Dr. Joseph L. Porter, Paola, Kan.

Columbia University for the Sloane Hospital for Women, New York, $50,000, by the will of William D. Sloane.

Columbia University, the residuary estate estimated at several million dollars, by the will of Emil F. Eno.

Germantown, Philadelphia, Hospital, $5,000, to endow a free bed in memory of George Wilson Harmer and Harry G. Hale Harmer; Children's Hospital, Pittsburgh, $2,500, to endow a free bed in memory of Elizabeth Hale Phillips and Hale Phillips; Allegany Hospital, Pittsburgh, $5,000, to endow a free bed in memory of Henry G. and Elizabeth Hale, these bequests to become operative upon the death of her two brothers, by the will of Mrs. Jane H. Harmer.

Presbyterian Hospital, Philadelphia, 10 per cent. of the residue of his estate by the will of Dr. DeBenneville J. Ludwig.

FOREIGN

Leprosy in Manila.—Twenty-three former inmates of the Culion Leper Colony were brought to Manila sometime ago to undergo a period of observation and thorough examination to determine whether the chaulmoogra oil treatment as administered at the colony had been effective in curing the leprosy with which they were affected. The three physicians under whose inspection they were placed, Drs. Johnston, Mercado and Ordonez, all agreed that there were no longer any indications of the disease present. The patients were allowed to go to their homes, but will be required to report every two or three weeks to their district health officers for the next two or three years. If there are any indications of a return of the disease, the patients will be returned to the leper colony.

Peking Hospital Opened.—Dr. Wallace Butterick, director of the China Medical Board, Dr. Simon Flexner of the Rockefeller Institute for Medical Research, New York, and Dr. William H. Welch, professor of pathology at Johns Hopkins University, Baltimore, were the guests of honor at the dedication of the new Sleeper-Davis Memorial Hospital, Peking, China. The new building is a five-story structure erected by the Methodist-Episcopal Church at a cost of $180,000 and has accommodation for 150 patients. The building is heated by steam, lighted by electricity, equipped with modern plumbing and provided with a diet kitchen. The patients are treated by American physicians who have Chinese assistants and are cared for by Chinese nurses, the head nurse being an American.

The Death of Sir Charles Tupper.—The Right Honorable Sir Charles Tupper, M.D., K.C.M.G., G.C.M.G., aged 94; Canadian physician and statesman; died in Bexley Hall, Kent, England, October 30. He was born at Aylesford, Nova Scotia, July 2, 1821, and obtained his doctorate degree in medicine from the University of Edinburgh in 1843. For twelve years Dr. Tupper practiced in Nova Scotia. He was then appointed as member from Cumberland County to the Nova Scotia Assembly, and in 1867 became prime minister of that province. In 1864 he did memorable work at the Quebec Conference for Confederation and also at the final Colonial Conference in London two years later. He declined a seat in the Canadian Cabinet in 1867 and also the chairmanship of the Intercolonial Railway Board in 1868. Two years later he was made a member of the Privy Council of the Dominion of Canada, and served as its president from 1870 to 1872, when he was appointed minister of inland revenue. In 1873 he became minister of customs, from 1878 to 1879 served as minister of public works and from 1879 to 1884 was minister of railways and canals. In 1884 he was made high commissioner for Canada in Great Britain and served for three years, and then after a lapse of a year in which he was minister of finance of the Dominion, he again returned to England as high commissioner and served until 1896. During this term of office he was one of her majesty's plenipotentiaries on the Fishery Commission at Washington in 1887-1888, and was also a plenipotentiary to negotiate the treaty between Canada and France in 1893. On Jan. 15, 1896, Sir Charles entered the Bowell Ministry as secretary of state and leader of the House of Commons, and from May 1 to July 8 of that year was prime minister of Canada, but with the overthrow of the ministry became leader of opposition in the House of Commons for four years. Honors were deservedly showered on Sir Charles Tupper. For fourteen consecutive terms he was a member of parliament for Cumberland County, N. S., and represented the county for thirty-one years. At one time he was president of the Canadian Medical Association. As minister of public works he created the department of railways and canals, and carried out the policy of the government in the enlargement of the Welland Canal, deepening of the St. Lawrence River, improvement of the Intercolonial Railway and the construction by a private company of the Canadian Pacific Railway. He was made a Commander of the Bath in 1867; K.C.M.G. in 1879, G.C.M.G. in 1886, a baronet in 1888 and an imperial privy councilor in 1908. Sir Charles Tupper was one of the notable figures in Canadian history and played a prominent part in the development of the Dominion from its establishment until his retirement from active life. He shared with the late Lord Strathcona the title of "Canada's Grand Old Man." While he will always be remembered as a political leader and a pioneer in the building of railroads and development of the Dominion, the medical profession of Canada esteemed him as one of the most prominent and able physicians the Dominion has produced.

LONDON LETTER

LONDON, Oct. 22, 1915.

The War

THE CARE OF THE WOUNDED

As pointed out before, the arrangements for the care of the wounded have been very well organized and probably have never been equaled in any previous war, unless by the Japanese. But there is the great difficulty that the wounded have often to lie for hours unaided because any attempt to help them at once draws the enemy's fire and they can be succored only when night gives protection from this danger. They are picked up as rapidly as the operations permit, carried to regimental aid posts by stretcher bearers, then through the field ambulance advance dressing stations, and then by motor ambulances to the casualty clearing stations. Here they remain until fit to proceed further or until operations of urgency are performed. They are then transferred by the hospital trains to the hospital bases. The work is performed with such celerity that as many as 450 patients have been transferred from ambulances to beds in the train in fifty-eight minutes. Whenever possible, patients are classified at the field ambulance headquarters, the most serious cases sent to the nearest casualty clearing station, and the less serious to the more distant. Use is also made of barge ambulances, which the canal system of France and Belgium has made available. Experiments with this novel method of transporting the wounded have proved so satisfactory that the tendency is to increase the number of barges. They offer the great advantage over motor cars or trains that there is absolutely no jolting. A new feature in the present war is the extent to which specialists of all kinds are employed in their own work. Like all classes in the profession, they have joined the army in large numbers. Thus at several of the casualty clearing stations there are specialists in abdominal work, and as many as possible of soldiers with abdominal gunshot wounds are sent to these stations. Moreover, they do not reach the station in the usual indirect manner, but are sent straight in by a field ambulance when picked up. It has been proposed that men wounded in the abdomen should undergo operation practically where they fall, in mobile operating theaters. But this is rendered impossible by the fact that enemy aeroplane observers direct fire on every place where they see men collected.

THE AMERICAN RED CROSS IN ENGLAND

At Paignton in Devonshire a large Red Cross hospital was established by the American women in England and staffed by an American unit which came over in September, 1914, with a staff of six surgeons and twenty-four nurses to which were added an equal number of British and Australian nurses. Later Dr. Crumley of the Mayo Clinic joined as pathologist and bacteriologist. The hospital has been in charge of Dr. Howard Beal of the Medical Service of the United States Army. He has just returned to America, and before leaving was entertained at a farewell luncheon by Sir William Osler, who is consulting physician to the hospital. In proposing a toast, Sir William said that the American women in England had achieved a fine piece of organizing work. Sir Alfred Keogh, director general of the Army Medical Corps, bore testimony to the excellent work done by the American Red Cross at Paignton, and by the Harvard and other units in France. In the name of our Army Medical Corps he thanked Dr. Beal and the American women in England. Dr. Beal said that the hospital now possessed 250 beds, with twenty others in an isolation block. During the year they had treated 1,900 patients with only five deaths. Americans who, like himself, were of English ancestry, felt the call of the blood, and he was confident that if the British War Office wanted to widen the scope of its medical service, he could get a corps of Americans with British blood who would be delighted to come.

EXHIBITION OF FRACTURE APPARATUS AT THE ROYAL SOCIETY OF MEDICINE

Experience is considerably modifying our views of the treatment of wounds and other injuries. A large number of splints and other apparatus for the treatment of fractures have already been devised under the exigencies of active service. Under the auspices of the army medical authorities, an exhibition of apparatus was held at the Royal Society of Medicine, and was largely attended by physicians, most of whom were in khaki. In opening the exhibition, Sir Alfred Keogh, director general of the Army Medical Department, said that it was a step toward making scientific information common property. The surgeons on active service had made great progress. Nevertheless much difference of opinion as to the best methods of treatment of injuries and of the complications of wounds still existed; for instance, there was as yet no agreement as to how best to treat tetanus, as to whether antitoxin, if it were used, should be injected intravenously, subcutaneously or intrathecally, and as to the value of phenol (carbolic acid) and other methods of treatment. Whether the apparatus in the exhibition would be applicable to civil conditions was not the immediate question, but he felt confident that for military surgery a system of splinting fractures had been worked out which marked a permanent advance. The objects had been to allow the patients to make those spontaneous movements which would not be detrimental to the fracture, to insure freedom from pain during transport, and to provide ready access to the wounds, especially for irrigation, which was the rule of the day in France. Many most ingenious apparatus were exhibited.

PARIS LETTER

PARIS, Oct. 14, 1915.

The War

TREATMENT OF ABDOMINAL WOUNDS

Last June Dr. Quénu, professor at the surgical clinic of the Faculté de médecine de Paris, read before the Société de chirurgie de Paris a paper which I mentioned in a previous letter (THE JOURNAL, July 24, 1915, p. 348). At a recent session of the same society Quénu reported 153 observations by Drs. Petit, Charrier, Bichat, Pascalis, Pellot, Bouvier and Caudrelier of abdominal wounds, of which 110 were operated on, 6 by the Murphy operation and 104 by laparotomy.

Summing up these observations, one obtains a total of 96 penetrating wounds (60 of which were intestinal) with a mortality of 55 per cent. This percentage indicates the advantage of operation over nonoperative treatment, which gives a mortality of at least 67 per cent. It may be said, moreover, that laparotomy has won the day with respect to abdominal wounds of war. Every penetrating wound should be operated on. The diagnosis of penetration is sometimes difficult; it is based largely on a calculation of the course followed by the projectile, figures from the position of the orifices of entry and exit, or, in the case of a single orifice, of the position of the projectile as indicated by roentgenograms. Practically, however, this last resource is not always available, and every wound of the abdominal wall (or even of the adjacent regions) with but a single orifice may be held under suspicion. In cases of doubt, if circumstances permit, it is well to make an exploratory laparotomy.

What are the conditions which call for operation? One should not waver and hesitate on the pretext of shock. Shock is by no means a constant phenomenon; it is often absent in the first hours and it seems to result principally from hemorrhage. Delay can only favor loss of blood and peritoneal infection. It is therefore necessary to decide definitely at the outset on operation or abstention. Promptness of operation is one of the principal elements of success. To attain this promptness greater rapidity in the removal and transportation of the wounded is needed, or indeed the operative equipment might be brought to the patient, that is, an operating station might be installed as near as possible to the firing line.

As for postoperative treatment, it appears from the observations of Pascalis, Bouvier and Caudrelier that it is preferable to remove the patients a short distance within two or three days after operation rather than to await the critical period.

ORTHOPEDIC APPLIANCES FOR CRIPPLES

M. Gratien Candace, a deputy, has found that some manufacturers of orthopedic apparatus sell at from 125 to 150 francs (about $25 to $30) the same types of apparatus which others sell at 200 francs (about $40). He has therefore demanded that the government exercise control over orthopedic manufacturing establishments. The question is under discussion in the Chamber of Deputies. It appears that the chaotic conditions in the manufacture of apparatus are due to the lack of agreement as to types of apparatus. This lack necessitates a multiplicity of models and produces a variability in price. The undersecretary for the medical service called the head physicians of the orthopedic centers of Paris, Lyons, Montpellier and Bordeaux into conference Aug. 10, 1915, to consider means of improving the situation by hastening the production and controlling the manufacture of apparatus. It was agreed that it would be wise to

seek a standard type of prothetic appliance for each kind of mutilation of the limbs; this would make it possible to establish a scale of prices that would apply uniformly to the products of all manufacturers. As a long period of inactivity is harmful from all points of view, the undersecretary decided that, without waiting for the final choice, each cripple would receive a temporary appliance, which would later be replaced by the standard type. Every cripple should in any case have two sets, in order that his activity and work may not be imperiled by the breaking of some part of a crutch or artificial limb.

It has also been asked if the government ought not to organize factories for orthopedic appliances in which the cripples themselves should be utilized. The undersecretary consulted surgeons and manufacturers on this point. These were unanimous in saying that the most ingenious prothetic appliances were invented, not by surgeons and manufacturers, with all their knowledge and experience, but by the cripples themselves. He therefore has sought for workmen crippled in the lower limbs, who before their incapacity, were woodworkers, mechanics and shoemakers, for employment in the manufacture of prothetic apparatus. At the Saint-Maurice asylum, near Paris, a workshop is being constructed, and also at Lyons, in connection with the Ecole des mutilés.

TREATMENT OF THE SEQUELAE OF WOUNDS BY PNEUMATIC MASSAGE

Dr. J. Bergonié, professor of biologic physics and of the clinic of medical electricity at the Faculté de médecine de Bordeaux, has reported to the Académie des sciences a method of treatment of the sequelae of wounds, which consists in applying to the affected members or regions a mechanical and pneumatic massage, by rhythmic variations of pressure transmitted to the parts through capsules or drums, one of the walls of which is alternately inflated and deflated. These various receptors or massage instruments may be adapted, in size and in form, to the most varied cases. They transmit pressures of a kilogram per square centimeter and more, and likewise the slightest degree of pressure, scarcely brushing the skin. The pressure may be regulated by a stopcock. The variations of pressure or pulsations are furnished by a piston pump without valves, giving 120 alternations of pressure and aspiration per minute. The apparatus already installed, with 25 mechanical masseurs, can give 300 pneumatic massage treatments in a six-hour day. Excellent results have been obtained in cases of paralysis due to fractures of the hand, stiffness of the fingers, vicious adherent or deep cicatrices, myositis due to retraction of cicatrices, edemas and trophic troubles, tendinous and muscular adhesions, etc.

This new method cannot take the place of manual massage administered by a trained and experienced physician, but it does permit a great number of wounded to benefit by massage.

TREATMENT OF WOUNDS BY MAGNESIUM CHLORID

Dr. Rosenblith of Paris has reported to the Académie de médecine the results which he has obtained by dressing wounds with a 1.2 per cent. solution of magnesium chlorid. Cicatrization is much more rapid in wounds so dressed than in the case of wounds dressed with the usual antiseptics. Prolonged suppuration and cytolysis are avoided.

BERLIN LETTER

BERLIN, Oct. 13, 1915.

Personal

Professor Oberländer, the urologist, died in Dresden, October 2, at the age of 60 years. He was the associate of Nitze, the inventor of the cystoscope, and as such contributed much to the development of the instrument and its use in urethroscopy. He was also associated with Professor Zulzer in the publication of the "Clinical Handbook of Genito-Urinary and Sexual Organs." He has published many monographs and textbooks bearing on the pathology and treatment of gonorrhea. He was the editor of the *Zeitschrift* and *Zentralblatt für Urologie*.

Health of Prussia and Germany

Two comprehensive publications which appeared recently contribute information as to health matters in Prussia and Germany. One book entitled "Health Matters in Prussia during 1913" was published by the medical division of the ministry of the interior; the other book was the eighteenth volume of medical statistics of the imperial health department. It was entitled "Vital Statistics of the German Empire during 1912." The one essential point brought out by these publications is the fact that health conditions have improved very much. The total mortality for 1913 in Prussia was 14.9 per thousand population, as against 15.49 in 1912 and 17.21 in 1911. The natural increase in population was 3,021 greater than in the preceding year, but because of the continued decrease in the birth rate, this increase did not equal that of previous years. The birth rate per thousand population was 28.17, as against 28.88. The decrease in the birth rate was 0.71 greater than the decrease in mortality, which was 0.59 lower than the next lowest rate. In 1912 the number of births was greater by 12,783 than in 1913; in 1906 it was 99,527 greater. In the cities 513,135 children were born, and in the country 696,520. Of the former, 16,354 were born dead; of the latter, 19,615. The provinces of West Prussia and Westphalia led in the number of children born living, whereas Brandenburg and the suburbs of Berlin had the lowest number of children born living. Exclusive of those infants born dead, 175,989 infants died during the first year of life; 71,880 of these died in the cities. The remaining 104,109 died in the rural districts. A lowering in mortality was particularly noticeable in cases in which the cause of death is given as congenital malnutrition and developmental defects, nervous diseases, cerebral apoplexy, old age, and diseases of the respiratory and circulatory organs. The mortality was higher where the cause of death was diseases of the digestive organs, suicide, murder or accidents.

There is no appreciable decrease in the mortality from diphtheria, tuberculosis and scarlet fever. On the other hand, the mortality from whooping cough has been lowered, whereas that of measles, smallpox and venereal diseases is higher. During this time there were 76,631 cases of diphtheria, as against 77,420 in 1912; 171 cases of cerebrospinal meningitis as against 178 cases; 5,220 cases of puerperal fever as against 4,888; 38,318 cases of pulmonary and laryngeal tuberculosis as against 39,820; 70,396 cases of scarlet fever as against 66,070; 9,443 cases of typhoid as against 11,353 cases, and 58 cases of smallpox as against 165 cases during the preceding year. Twenty of the smallpox patients were foreigners. Most of the native or domestic cases occurred among persons who were infected by the foreigners. Forty-one of these patients had been given a timely vaccination, as against thirty-two similar cases in 1912. In each case this was the first vaccination, but vaccination could not be held responsible for the subsequent fatal illness.

In 1913 there were 2,344 general hospitals, exclusive of private hospitals with ten beds or less. The number of available beds was 1,177,184. These hospitals took care of 1,534,209 patients, with a total of 42,715,475 bed days.

These statistics also show that, based on the census of 1910 and 1900, the number of living persons between the ages of 30 and 60 has increased by 9.6 during this decade over all other age classes. Between the ages of 1 and 60, this increase was 3.3 per cent., although the deaths among the nurslings diminished by 3.4 per cent. The death rate as well as the birth rate of 1912 was the lowest recorded, although the figures of Prussia for 1913 are still lower. A consideration of the mortality by ages shows a considerable diminution in infant mortality as against 1911, noted for the extreme heat. The death rate between 1 and 15 years is also lower, but has not decreased among those dying after 15 years. The mortality from gastro-intestinal diseases is considerably lower, whereas the mortality is higher for diseases of the circulatory organs, the appendix, malignant disease and puerperal fever than it was during the half decade of 1905-1910. During the same period, the death rate from pulmonary tuberculosis was 15.2, as against 13.1 in 1913. The total death rate per 10,000 of the middle class fell from 175.2 to 155.4 per cent.

Transportation of the Wounded by Aerial Tramway

One of the Bavarian divisions in the south Vosges mountains has built several electric aerial tramways (*Drahtseilbahn*) for the purpose of transporting ammunition, food and building material for the army. Several hundred soldiers under the direction of engineering officers constitute the personnel of this railway. After a battle, or at any other time that the wounded need to be transported, special baskets are attached to this tramway in which the wounded can be transported comfortably through the mountain territory to the nearest railway station in the valleys.

Deaths

Brigadier-General George Miller Sternberg, Surgeon-General, U. S. Army, from 1893 to 1902; died at his home in Washington, D. C., November 3, aged 77. Dr. Sternberg was born at Hartwick Seminary, Otsego County, N. Y., June 8, 1838; received his preliminary education in that institution and commenced the study of medicine at Cooperstown, N. Y., under the preceptorship of Dr. Horace Lathrop and then attended lectures in the College of Physicians and Surgeons in the City of New York from which he was graduated in 1860. He entered the Army as assistant surgeon in 1861, was promoted to captain in 1866, to major in 1875, to lieutenant-colonel in 1891 and two years later was appointed Surgeon-General of the Army; he was retired June 8, 1902. During his more than forty years of active service in the Army, General Sternberg was repeatedly on duty against Indians, in epidemics of yellow fever and cholera in addition to the ordinary duties which pertain to medical officers; he was a member and secretary of the Havana Yellow Fever Commission of the National Board of Health in 1879; a delegate from the United States to the International Sanitary Conference at Rome, in 1885; was detailed to make investigations in Brazil, Mexico and Cuba relating to the etiology and prevention of yellow fever, from 1887 to 1889, and was consulting bacteriologist to the health officer of the port of New York in 1892 when the cholera ships came to that port. He was president of the American Medical Association in 1896; president of the Association of Military Surgeons of the United States in 1894; once president of the American Public Health Association; president of the section on Military Medicine and Surgery of the Pan-American Congress; vice president of the American Microscopical Society and a member of many other learned societies at home and abroad. General Sternberg was best known as a bacteriologist; his work on "Bacteria" published in 1884 and his "Manual of Bacteriology" which appeared in 1892 are standard works. He was a pioneer in this line of research work and was a prolific writer on the etiology of diseases, comparative value of methods of disinfection, and the like. Since his retirement from the Army, General Sternberg has resided in Washington, D. C. On his seventieth birthday, June 8, 1908, he was given a complimentary banquet by residents of Washington, both military and civilian, who paid tribute to the service to humanity rendered by General Sternberg, and after a number of laudatory addresses, presented him with a silver loving cup. While General Sternberg made an enviable record as a military sanitarian, having been repeatedly commended in orders, he was a scientist of world-wide fame, and a genial gentleman beloved by all with whom he came in contact.

BRIGADIER-GENERAL GEORGE MILLER STERNBERG, 1838-1915.

Nathaniel D. Cox, M.D. Medical College of Indiana, Indianapolis, 1884; aged 73; formerly a Fellow of the American Medical Association; a member of the Indiana State Medical Association and a charter member of the Owen County Medical Society; a veteran of the Civil War; died at his home in Spencer, Ind., October 27, from heart disease.

Edward Porter Colby, M.D. Long Island College Hospital, Brooklyn, 1861; aged 76; acting assistant surgeon, United States Navy, for three years during the Civil War; professor of nervous diseases in the Boston University School of Medicine; consulting neurologist to the Massachusetts Homeopathic Hospital and the Westborough Insane Hospital; died at his home in Boston, November 1.

Edward S. Crill, M.D. Eclectic Medical Institute, Cincinnati, 1865; aged 72; state senator in the Florida Legislature from 1880 to 1885 and from 1897 to 1901; state treasurer from 1885 to 1889; and from 1889 until the time of his death president of the East Florida State and Trust Company, Palatka; once mayor of that city; died at his home October 23, from uremia.

Isaac L. Firebaugh, M.D. Miami Medical College, Cincinnati, 1875; aged 68; of Robinson, Ill.; a Fellow of the American Medical Association; for many years a member and once president of the Aesculapian Society of the Wabash Valley; for forty years a practitioner of Robinson; died in the Presbyterian Hospital, Chicago, October 25, from cirrhosis of the liver.

Julius Augustus Post, M.D. Bellevue Hospital Medical College, 1866; aged 68; a member of the Michigan State Medical Society; a medical cadet during the Civil War; for more than forty years a practitioner of Lansing, Mich.; once assistant superintendent of the Lansing City Hospital; died suddenly on the street in Lansing, October 28, from heart disease.

Horace Greeley Norton, M.D. University of Pennsylvania, Philadelphia, 1880; aged 57; a member of the Medical Society of New Jersey and secretary of the State Board of Medical Examiners; for two terms president of the Mercer and Monmouth County medical societies; died in St. Francis' Hospital, Trenton, October 27, from cerebral hemorrhage.

John White Stevenson, M.D. Medical College of Ohio, Cincinnati, 1883; aged 56; a Fellow of the American Medical Association; acting assistant surgeon, U. S. P. H. S., since 1893 and in charge of the office in Cincinnati; for thirty years a practitioner in that city; died at his home in Walnut Hill, Cincinnati, October 24, from heart disease.

Ira Morton Martin, M.D. Kentucky School of Medicine, Louisville, 1891; aged 49; formerly a member of the State Medical Society of Wisconsin; a specialist on diseases of the eye, ear, nose and throat; for the last nine years a practitioner of Green Bay, Wis.; died suddenly on the Oneida Reservation, from heart disease.

Hugh Clayton Blair, M.D. Vanderbilt University, Nashville, Tenn., 1908; aged 29; a Fellow of the American Medical Association and local surgeon of the Sante Fe System at Rincon, N. M., while on his way to Albuquerque, N. M., to seek hospital care for appendicitis; died on the train, October 27.

William M. Johnson, M.D. American Eclectic Medical College, Cincinnati, 1857; aged 86; a member of the Illinois State Medical Society and president of the Wayne County Medical Society in 1910; for sixty years a resident of Johnsonville, Ill.; died at his home, August 13, from carcinoma.

Josias Louis Duval, M.D. McGill University, Montreal, 1898; aged 39; of St. John West, N. B.; major in the Canadian Army Medical Corps and on duty with the First Canadian Field Ambulance in Flanders; is reported on the casualty list of September 1, as having died in Flanders.

John Ditmars VanNuys, M.D. Jefferson Medical College, 1870; aged 69; formerly a Fellow of the American Medical

Association; for twenty years physician at the Osawatamie State Hospital, Osawatamie, Kan.; died at the home of his son in New Castle, Ind., November 1, from myocarditis.

Ira D. Knotts, M.D. University of Pennsylvania, Philadelphia, 1887; aged 58; formerly a Fellow of the American Medical Association; and president of the Greene County (Pa.) Medical Society; of Davistown, Pa.; died in a hospital in Pittsburgh, October 22, from cerebral hemorrhage.

Timothy Jerome Regan, M.D. College of Physicians and Surgeons in the City of New York, 1884; aged 54; for many years a member of the staff of the New York Polyclinic Hospital and of the Brooklyn Board of Health; died at his home in Brooklyn, October 27, from nervous breakdown.

Herbert Eugene Knowlton, M.D. Harvard Medical School, 1891; aged 49; formerly a member of the Massachusetts Medical Society and a practitioner of Cambridge, Mass., and Belfast, Me.; died at his winter home in National City, Calif., October 24, from septicemia.

George D. Johnston, M.D. Washington University, St. Louis, 1858; aged 79; for many years president of the St. Louis Car Shops, but for the last thirty-five years a ranchman and real estate dealer of San Antonio, Texas; died at his home in that city, October 28.

Joseph Robert Rosson, M.D. University of Alabama, Mobile, 1888; aged 46; formerly a druggist, auditor of the Southern Express Company and a postoffice inspector; editor of the *Cullman Democrat;* died at his home in Cullman, Ala., July 29, from nephritis.

John J. Kennedy, M.D. Starling Medical College, Columbus, Ohio, 1897; aged 47; of Mill Creek, W. Va.; was murdered October 31. The motive is supposed to have been robbery. Dr. Kennedy's body was found on a lonely road near Mill Creek.

Victor Gus Becska, M.D. Detroit College of Medicine and Surgery, 1907; aged 34; a member of the Medical Society of New Jersey; and a member of the Passaic (N. J.) Board of Health for two years; died at his home in that city, October 25.

Edwin D. Schaeffer, M.D. Baltimore Medical College, 1893; aged 48; a Fellow of the American Medical Association; for many years a member of the school board of Reading, Pa.; died at his home in that city, October 23, from septicemia.

Alan Butler Murray, M.D. College of Physicians and Surgeons in the City of New York, 1890; aged 50; for many years a practitioner of Montana, but recently a resident of Clinton, Ind.; died in a hotel in Terre Haute, Ind., October 27.

George Frank Harris (license, Illinois), aged 96; a practitioner for seventy-five years; an honorary member of the Morgan County (Ill.) Medical Society; died at his summer home near Jacksonville, Ill., August 9, from lobar pneumonia.

James McGeoch, M.D. Saginaw Valley Medical College, Saginaw, Mich., 1900; aged 56; a Fellow of the American Medical Association and a well-known practitioner of Bay City, Mich.; died at his home October 28, from pneumonia.

James Gerald Cullen, M.D. University of Pennsylvania, Philadelphia, 1905; aged 38; a member of the Ohio State Medical Association and city physician of Toledo for three years; died at his home in Toledo, October 26.

E. R. Young, M.D. Medical College of Georgia, Augusta, 1859; aged 83; one of the oldest practitioners of Thomas County, Ga.; and for thirty years postmaster of Metcalfe; died at his home, August 6, from heart disease.

Joseph Leslie (license, years of practice, Illinois, 1877), aged 77; a practitioner of Macon County, Ill., for forty-eight years; and until five years ago a practitioner of Elwin, Ill.; died at his home in Decatur, Ill., October 26.

Horace K. Braisted, M.D. University of Michigan, Homeopathic College, Ann Arbor, 1880; aged 59; a physician and druggist of Delta, Colo.; died at his home, July 23, from cerebral concussion due to accidental injury.

Nicholas F. Schwartz, M.D. University of Wooster, Cleveland, 1872; aged 67; for many years a practitioner of Cuyahoga County, Ohio, and recently a resident of Chagrin Falls; died in Auburn, Ohio, October 27.

Lockhart Brooks Farrar, M.D. Berkshire Medical College, Pittsfield, Mass., 1848; aged 93; for more than half a century a resident of Ford County, Ill.; died at his home in Paxton, October 30, from senile debility.

John N. Sigler (license, Indiana, 1897), aged 66; died at his farm near Sedalia, Ind., October 15.

Marriages

P. A. Surg. Julian Mason Gillespie, U. S. P. H. S., Ellis Island, N. Y., to Miss Verna Duplantis of New Orleans, in New York City, October 20.

Benjamin Franklin Montgomery, M.D., Stevens City, Va., to Miss Lucy Deahl of Barryville, Va., at Washington, D. C., October 27.

Daniel James Ellison, M.D., Lowell, Mass., to Miss Anna Gale Newhall of Lynn, Mass., at Swam Scott, Mass., November 3.

John Samuel Hick Leard, M.D., Forest Hills, Boston, to Miss Isabelle H. Earnshaw of West Roxbury, Boston, October 26.

James Louis Quesenberry, M.D., Worthington, Ky., to Mrs. Ada Freeman Bauer of St. Matthews, Ky., October 28.

Hubert Benbury Haywood, M.D., Raleigh, N. C., to Miss Margaret E. Manor of Harrisonburg, Va., October 19.

Milton Augustus Broemser, M.D., Holly, Colo., to Miss Berenice Edwords of Kansas City, Mo., October 26.

Abraham Hyman, M.D., New York City, to Miss Belle Davis of Erie, Pa., in New York City, October 28.

Edgar Paul McNamee, M.D., Cleveland, Ohio, to Miss Ethel Marian Petrie of Oneida, N. Y., October 30.

Lawrence E. Kelley, M.D., Des Moines, Iowa, to Miss Sue Gunn of Kellogg, Iowa, at Des Moines, October 2.

Leon Wolf, M.D., Portland, Ore., to Miss Rose L. Hochberg of New York City, in Portland, October 21.

Thomas Francis Hennessey, M.D., Lynn, Mass., to Miss Gertrude Miller of Allston, Boston, October 27.

Albert David Kaiser, M.D., Rochester, N. Y., to Miss Margaret Dickinson of Brooklyn, November 4.

Matt Blakely Weir, M.D., to Miss Pearl Parker, both of Grant, Iowa, at Red Oak, Iowa, September 14.

Russell Comber Doolittle, M.D., Des Moines, Iowa, to Miss Myrtle Cordner of Chicago, October 2.

Henry W. Greist, M.D., Casper, Wyo., to Mrs. Mollie Ward Butler of Monticello, Ind., October 18.

Roscoe E. Cook, M.D., to Miss Floy D. Sloan, both of Des Moines, Iowa, at Boone, Ia., September 16.

Warren E. Bradbury, M.D., Clinton, Ill., to Miss Ida Brulle of Neillsville, Wis., October 26.

Lawrence Leslie Irwin, M.D., to Miss Zona M. McDowell, both of Bloomington, Ill., October 10.

Frank Kaiser Bartlett, M.D., Ogden, Utah, to Miss Mary Paxton of Aurora, Ill., recently.

Samuel D. Rosenthal, M.D., to Miss Tubie Greenspohn, both of Chicago, November 7.

Association News

THE DETROIT SESSION

Officers of Local Committee on Arrangements and Chairmen of Subcommittees

The following constitute the officers of the local committee for the Detroit session of the American Medical Association:

Chairman: Louis J. Hirschman.
Secretary: Ernest K. Cullen.
Treasurer: Thaddeus H. Walker.

The following physicians are chairmen of the various subcommittees of the Committee on Arrangements:

Finance: E. W. Haass.
Entertainment: A. D. Holmes.
Hotel: Roland Parmeter.
Halls and Meeting Places: F. B. Tibbals.
Registration: F. B. Walker.
Scientific Exhibit: J. W. Vaughan.
Commercial Exhibit: John N. Bell.
Printing and Publication: J. H. Dempster.
Automobiles: Angus McLean.

The local committee on arrangements has established an office at the Wayne County Medical Society Building, 33 High Street E., Detroit, Mich. All communications should be mailed to this address.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

DR. CHARLES FLESH FOOD

In Brooklyn there is a concern styled Dr. Charles Flesh Food Company that sells "toilet specialties." In addition to rouge and face powders of various tints as well as soaps and toilet creams, the concern puts out such preparations as "Foot Relief" for "sore, tired, aching feet" and "Revivo" claimed to be a "Remedy for Dandruff and All Scalp Diseases." The "Dr. Charles Co. Tonic Tablets" are put forward by the company as "the very best preparation for restoring health to the debilitated; rich blood to the anemic; relief to women from their specific ills, strength to those tottering along life's pathway with a burden of liver and kidney troubles, nervous prostration, dyspepsia and many wasting diseases that lead to consumption." The product on which, apparently, they lay more emphasis than any other is "Dr. Charles Flesh Food" an ointment sold under such claims as:

"Applied to the skin nourishes by absorption."

"It builds firm, healthy flesh."

"Acts quickly and surely on a skin that is seamed and wrinkled either by exposure or age, smoothing away furrows of the forehead and lines about the eyes and mouth."

"Undeveloped busts and those shrunken through sickness or nursing may be materially increased in size; made full, firm, plump and rounded out into a beautiful contour by the use of this wonderful flesh developer. IT ACTS ALIKE ON THE GROWING GIRL AND MATURED WOMAN."

In an advertising booklet the company declares that Dr. Charles Flesh Food has the endorsement of physicians and to prove it declares:

"The *Therapeutic Record*, a leading Medical Journal tells in its August, 1908, number of two lady patients who used it [Dr. Charles Flesh Food] under the advice of their physician, Dr. M. P. Creel."

DR. CHARLES
FLESH
FOOD
THE
GREAT
BEAUTIFIER
Try this preparation to-day and note its wonderful pleasing effects. It has been used and recommended more than fifty years for the complexion and to increase firm, healthy flesh on the face, neck, arms and developing the bust.
There is absolutely nothing like Dr Charles Flesh Food to remove wrinkles, crow's feet, pimples, freckles, sallowness, etc., as one application will prove.
50 cents a box at all druggists, department stores or direct.
Send 4 cents, postage, for a sample box and illustrated book, "Art of Massage."
Dr. Charles' Flesh Food Co., Brooklyn, N. Y.

An appeal from the Chicago Daily News.

The *Therapeutic Record* is one of those medical journals (Heaven save the mark!) that are supported by the nostrum interests. From editorial endorsements of a fraudulent "rupture cure" (Stuart's Plas-Tr-Pads) to advertisements of such frauds as fake ear drums, Duffy's Malt Whiskey and Antikamnia, it is not a far call to the equally fraudulent "Flesh Food." Neither is one surprised to find in the advertising pages of the *Therapeutic Record* advertisements of Stuart's Plas-Tr-Pads and Dr. Charles Flesh Food. The *quid pro quo* is thus established.

Whatever Dr. Charles Flesh Food may lack in therapeutic efficiency it makes up in color and odor. The preparation is an appealing pink, highly perfumed ointment. A box of the stuff was submitted to the Chemical Laboratory of the American Medical Association and in due time one of the chemists gave the results of his investigation. The findings may be summed up as follows:

Starch	38.5 per cent.
Petrolatum (vaseline)	51.0 per cent.
Zinc oxid	2.0 per cent.
Impure stearic acid	1.5 per cent.
Perfume, coloring matter.	

From the report it is apparent that the alleged "flesh food" is no better than, if as good as, an ointment made by mixing five parts of vaseline with four parts of starch and adding a dab of zinc oxid. Dr. Charles Flesh Food is a fraud and if articles of this nature come under the purview of the federal Food and Drugs Act the concern should be prosecuted for misbranding. The stuff is not, in any sense of the word, a "flesh food"; it does not "build firm healthy flesh," it will not develop the bust and it does not "nourish by absorption."

"WHAT IS THE CHARACTER OF THE MEDICAL JOURNALS YOU READ?"

"At the session of the House of Delegates held in San Francisco, the Board of Trustees presented a special report on the work of the Council on Pharmacy and Chemistry in which it condemned in unqualified terms the advertising in medical journals of proprietary nostrums.

"We do not believe that the sincerity of the philanthropic desires of the American Medical Association in its efforts to destroy the manufacture and sale of nostrums, proprietary or otherwise, is questioned by any one except the financially interested purveyors of these fraudulent remedial concoctions. We do not believe that any one, not excepting the foregoing mentioned purveyors, questions the honesty of the reports of the Council on Pharmacy and Chemistry. It must furthermore appear patent to every one that financial gain is the one and only aim of these conscienceless individuals who dupe the public, that there is no more philanthropy in their reptilious souls than there is sympathy for any living thing in the brain of the venomous adder. No one with a modicum of reason believes that the ordinary business man invests his capital in exploiting any form of merchandise for your, rather than his material benefit. His is a crusade for profit. The American Medical Association is in need of money to carry on its beneficent projects, but is its crusade against nostrums tinged with the hue of expected profit or is it a truly altruistic crusade? The query requires no answer. It is self evident.

"Referring to the subject of the man with purely business instincts: in placing an article on the market he estimates the cost of production, its greatest obtainable profits, and the ways and means to create a demand for his ware. If its intrinsic value is approximately recognizable he must attune his profits to that general knowledge. The purchaser of his wares cannot be fooled or swindled to any great extent. If they be, their loss is a material one and can be recovered from. But when an exploiter places on the market a nostrum of no intrinsic value (excepting the bottle and cork) for which he claims virtues which it does not possess and which the wise and the unwise cannot dispute until victimized; when he envelops it in an air of mystery, appealing to superstition, ever present in the human mind, he robs the purchaser of his money and health, thereby becoming a thief of the most despicable order. Any medical journal printing the fraudulent claims contained in the advertisements of the nostrums condemned by the Council on Pharmacy and Chemistry is an accessory to this act of thievery and the subscriber to such journals voluntarily assumes the position of an accomplice."—*New York State Jour. Med.*, October, 1915.

Laboratory Research and Type of Individual.—The laboratory worker who conducts his investigations without regard to type leaves them open to criticism. Thus metabolism experiments must be conducted on individuals of the same type or the subjects will react differently to a given diet. Doubtless in this fact lies a possible suggestion for the solution of certain discrepancies reported by various laboratories working on a given problem.—John Bryant, M.D., *Boston Medical and Surgical Journal*, Sept. 9, 1915.

Correspondence

An Accurate Microchemical Method of Estimating Sugar in the Blood

To the Editor:—The microchemical method of estimating blood sugar, I described in The Journal, Nov. 7, 1914, p. 1667, is very reliable. Numerous examinations of blood, with and without the addition of known quantities of sugar, yield remarkably concordant and exact results. The maximum error encountered does not exceed ± 3 per cent.

I wish, however, to call attention to the fact that the apparatus (styled the Epstein microsaccharimeter) sold on the market has until lately included standard tubes containing solutions of improper color intensity. Estimations of blood sugar made with such standard tubes are necessarily faulty.

I have attempted to reach all those using this apparatus by personal communication, to apprise them of the error. Standard tubes are now on sale by Eimer and Amend, and also by E. Leitz of New York. These have been prepared under my supervision and contain the proper solutions.

Albert A. Epstein, M.D., New York.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

MAASE-ZONDEK TEST FOR URIC ACID IN BLOOD

To the Editor:—Please describe in your columns the method of Maase and Zondek for testing uric acid in the blood.

H. C. Rucker, M.D., Richmond, Va.

Answer.—This colorimetric method was described by Maase and Zondek in the *Münchener medizinische Wochenschrift*, 1915, lxii, 1110. The following is their description of the method: From the fasting patient 6 or 7 c.c. of blood are drawn into an Erlenmeyer flask containing a little sodium fluorid. Then exactly 5 c.c. of the blood is taken into a pipet and transferred to 25 c.c. hundredth-normal acetic acid and stirred vigorously while it is being heated until coagulation is complete. It is then filtered while hot into a porcelain dish. The filtrate is limpid, but a slight yellowish tint does no harm. The residue and dish are then rinsed at once with about 60 or 70 c.c. of boiling water, to which—to avoid colloid solutions—about 0.5 gm. sodium acetate has been added. This brings the total filtrate to about 100 c.c. Then 2.5 c.c. of 50 per cent. acetic acid are added and the whole is evaporated on the water bath down to exactly 5 c.c., which usually takes about an hour. There is no precipitation as a rule with this technic, but even if there is, this is immaterial. After neutralizing with a saturated solution of sodium carbonate, added a drop at a time, the contents of the dish are transferred to a 25-c.c. measuring flask and the dish is rinsed with cold water. Then 2.5 c.c. of saturated solution of sodium carbonate and 1 c.c. of the phosphotungstic acid reagent are added, and the total amount of fluid brought up to 25 c.c. by addition of distilled water. Then the mixture is allowed to stand for ten minutes to allow the blue tint to reach its greatest intensity.

Generally the fluid is limpid. It is then compared in the Autenrieth-Königsberger colorimeter with the scale for uric acid. If the tint does not correspond exactly, the fluid should be filtered once or twice. The tint is examined by good daylight, and by diffuse light. In very hot weather the fluids had better be kept cool.

They give a table of values for minute gradations, ranging from 7.7 mg. uric acid at the 20 mark to 0.8 mg. at the 85 mark. The phosphotungstic acid reagent is made exactly according to Autenrieth's directions (*München. med. Wchnschr.*, 1914, lxi, 457). They have tested all the other substances in the blood that might interfere with the reaction, but found that none reduce phosphotungstic acid except in a concentration such as could scarcely ever occur in the blood, even under extreme conditions. At the same time, to avoid possible error from this source, they deduct always 0.5 mg. as the standard figure, determined by various tests described.

The blood to be tested must have been drawn within twenty-four hours at longest, as otherwise products of albumin disintegration might interfere with the reaction. Another point they emphasize is that the evaporation must be carried to the exact point mentioned, namely, down to 5 c.c. Certain volatile substances in the mixture are driven off by this, which otherwise might disturb the reaction. The dish they use has two blue rings under the glaze, marking off the 10-c.c. and the 5-c.c. capacity. They always take whole blood for the test, as Zondek has demonstrated that the blood clot may contain more or less uric acid.

Maase and Zondek are assistants at the first University Medical Clinic at Berlin, of which His is director. Their technic requires only 5 c.c. of blood and not more than an hour and a half of time. It scarcely ever fails, they say, and is simple enough to be applied by even those unskilled in chemical research. The amounts of uric acid added to the blood are recovered with the loss of, at most, a few tenths of a milligram. The findings, especially the averages, harmonize with the figures obtained by other authors with far more complicated methods. Precipitation of the uric acid is avoided, and with it the losses inseparable from this. The average in thirty healthy persons, mostly soldiers, after three days of a purin-free diet, was 2.5 mg. uric acid in 100 c.c. of whole blood. (Steinitz' average, with the Folin-Denis method, was 2.7 mg.) In five cases of gout, the figures were 5, 4.8, 4.9, 4.5 and 5.5 mg. uric acid after three days of purin-free diet. On prolonged abstention from purins, the findings in true gout indicated a decline, the figure dropping from 5 to 4 mg. and even to 1.8 mg. in one case.

Autenrieth prepares the phosphotungstic acid reagent by boiling 100 gm. of sodium tungstate with 80 c.c. of 85 per cent. phosphoric acid and 750 c.c. of water for three or four hours, under a reflux condenser, and then diluting, after cooling, with water to 1 liter. The 85 per cent. phosphoric acid is made by gradually stirring 65 gm. of commercial phosphoric acid anhydrid into 30 c.c. water. The red sediment is separated out over an asbestos filter.

ARTICLES ON DETECTION OF TYPHOID CARRIERS

To the Editor:—I should appreciate references to recent publications bearing on the methods and reliability of the methods of examination of supposed typhoid carriers. W. S. Rankin, M.D., Raleigh, N. C.

Answer.—The following may be referred to:

Bigelow, E. B.: Value of Widal Reaction in Detection of Typhoid Carrier, The Journal, May 4, 1912, p. 1339.

Gay, F. P., and Claypole, E. J.: Typhoid-Carrier State in Rabbits as Method of Determining Comparative Immunizing Value of Preparations of Typhoid Bacillus, *Arch. Int. Med.*, December, 1913, p. 613.

Krumwiede, C., and Pratt, J. S.: Further Observations on the Growth of Bacteria on Media Containing Various Anilin Dyes, with Special Reference to an Enrichment Method for Typhoid and Paratyphoid Bacilli, *Jour. Exper. Med.*, 1914, xix, 501.

Ebeling, E.: Typhoid Bacilli in Blood in Healthy Carrier, *Berl. klin. Wchnschr.*, April 13, 1914; abstr., The Journal, May 16, 1914, p. 1588.

Mayer, A.: Examination of Gall Bladder after Cholecystectomy to Discover Chronic Typhoid Bacilli Carriers, *München. med. Wchnschr.*, May 19, 1914; abst., The Journal, June 27, 1914, p. 2054.

Schmitz, H.: Determination of Typhoid Bacilli in Stools, *München. med. Wchnschr.*, Oct. 20, 1914.

Wile, V. A.: Typhoid Bacilli in Blood Revealed by Microscope, *Ugesk. f. Læger*, Sept. 24, 1914; abstr., The Journal, Nov. 14, 1914, p. 1798.

Carnot, P., and Weill-Halle, B.: Method of Determining the Presence of Bacillus Typhosus, abstr., The Journal, Jan. 16, 1915, p. 260; Simplified Technic for Cultivating Typhoid Bacilli from Blood, Bile and Stools, *Presse méd.*, March 25, 1915.

Schmidt, P.: Modified Bile Technic for Cultivation of Typhoid Bacilli from Blood, *Deutsch. med. Wchnschr.*, Jan. 7, 1915.

Koenigsfeld, H.: Improved Technic for Cultivation of Typhoid Bacilli, *München. med. Wchnschr.*, Jan. 26, 1915; abstr., The Journal, March 13, 1915, p. 950.

Gautier, P.: Motility Test for Typhoid Bacilli in Stools, *Rev. méd. de la Suisse romande*, July, 1915; abstr., The Journal, Sept. 4, 1915, p. 908.

NO ANTINARCOTIC LAW IN CANADA

To the Editor:—Will you be good enough to inform me whether there is in Canada anything corresponding to the Harrison Narcotic Law? The question has come up concerning an individual who has recently been treated for the opium habit and is thinking of going to Canada.

W. G. Richards, M.D., Billings, Mont.

Answer.—Canada has no such law as the Harrison Narcotic Law, nor is there any law serving the same purpose.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CALIFORNIA: Los Angeles, December 14. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.

DELAWARE: Dover and Wilmington, December 14. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

FLORIDA: Jacksonville, December 7-8. Sec., Dr. E. W. Warren, 102 Front St., Palatka.

KENTUCKY: Louisville, December 7-9. Sec., Dr. A. T. McCormack, Bowling Green.

LOUISIANA: New Orleans, December 2-4. Sec., Dr. E. L. Leckert, 716 Macheca Bldg., New Orleans.

MARYLAND: Regular, Baltimore, December 14. Sec., Dr. J. McP. Scott, Hagerstown. Homeopathic, Baltimore, December 15-16. Sec., Dr. O. N. Duvall, 1817 N. Fulton Ave., Baltimore.

MISSOURI: St. Louis, December 13-15. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

OHIO: Columbus, December 7-9. Sec., Dr. George H. Matson, Columbus.

VIRGINIA: Richmond, December 14-17. Sec., Dr. J. N. Barney, Fredericksburg.

Illinois May Report

Dr. C. St. Clair Drake, secretary of the Illinois State Board of Health, reports the written examination held at Chicago, May 13-15, 1915. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 165, of whom 135 passed and 30 failed. The following colleges were represented:

College	PASSED	Year Grad.	Total No. Licensed
Georgetown University		(1913)	1
George Washington University		(1907)	1
Bennett Medical College		(1914) (1915, 13)	14
Chicago College of Med. and Surg.		(1914, 2) (1915, 16)	18
Hahnemann Med. Coll. and Hosp., Chicago		(1914) (1915, 4)	5
Jenner Medical College		(1915)	1
Northwestern University		(1914, 2) (1915, 14)	16
Rush Medical College		(1914, 4) (1915, 29)	33
University of Illinois		(1913) (1914, 2) (1915, 30)	33
State Univ. of Iowa, Coll. of Med.		(1912)	1
Johns Hopkins University		(1913)	1
University of Maryland		(1912)	1
Harvard University		(1913)	1
Detroit College of Med. and Surg.		(1910)	1
St. Louis College of Phys. and Surgs.		(1903)	1
University of Pennsylvania		(1900)	1
University of Pittsburgh		(1914)	1
Meharry Medical College		(1914)	1
University of Texas		(1912)	1
Queens University		(1901)	1
Trinity Medical College		(1896)	1
University of Naples		(1909)	1
Howard University	FAILED	(1914)	1
Bennett Medical College		(1913) (1914) (1915, 2)	4
Chicago Coll. of Med. and Surg.		(1913) (1914, 4) (1915, 2)	7
College of Med. and Surg., Ph.Med., Chicago		(1910)	1
Hahnemann Med. Coll. and Hosp., Chicago		(1914) (1915)	2
Illinois Medical College		(1910)	1
Jenner Medical College		(1914)	1
National Medical University		(1909)	1
Northwestern University		(1914)	1
University of Illinois		(1912)	1
Kentucky School of Medicine		(1903)	1
University of Louisville		(1913)	1
Minnesota Hospital College		(1884)	1
National Univ. of Arts and Science		(1914)	1
St. Louis College of Phys. and Surgs.		(1908)	1
St. Louis University		(1914)	1
Eclectic Medical College, Cincinnati		(1894)	1
Meharry Medical College		(1911) (1912)	2
National University, Athens		(1912)	1

Kentucky June Report

Dr. A. T. McCormack, secretary of the State Board of Health of Kentucky, reports the written examination held at Louisville, June 8-10, 1915. The total number of subjects examined in was 11; total number of questions asked, 110; percentage required to pass, 70. The total number of candidates examined was 84, of whom 74 passed and 8 failed, including 2 osteopaths. One candidate was licensed through reciprocity and 2 by special order of the board. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
Indiana University		(1915)	81
Louisville National Medical College		(1911)	70
University of Louisville		(1915)	76, 76, 76, 77, 77, 79, 79, 79, 80, 80, 80, 80, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 83, 84, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 88, 89, 89, 89, 89, 93, *
Baltimore Medical College		(1911)	82
St. Louis University		(1915)	82
Lincoln Memorial University		(1914) 79; (1915)	88
Meharry Medical College		(1915) 76, 77, 78, 83, 86	
Vanderbilt University		(1914) 80, 87; (1915) 83, 85, 86, 86, 86, 88, 89, 90	
Medical College of Virginia		(1915)	88
Louisville National Medical College	FAILED	(1912)	73
University of Louisville		(1912) 63, 67; (1915)	68
St. Louis College of Physicians and Surgeons		(1915)	68
University of Nashville		(1908)†	53

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Johns Hopkins University		(1913)	Maryland

College	LICENSED BY SPECIAL ORDER OF THE BOARD	Year Grad.	Total No. Licensed
University of Louisville		(1882) (1897)	2

* No grade given.

† Information obtained indicates that this candidate is not a graduate.

Book Notices

HABITS THAT HANDICAP. The Menace of Opium, Alcohol and Tobacco and the Remedy. By Charles B. Towns. Cloth. Price, $1.20 net. Pp. 289. New York: The Century Company, 1915.

After perusing this little volume, one is at a loss to know the real object of the author in writing it. Did he intend it to be read by physicians or by the laity, or both? He surely could not imagine that physicians would readily subscribe to his wholesale arraignment of the medical profession by the purchase of his cleverly gotten up journalistic production. The book contains much that is true, much that is valuable; but the man without a medical training who attempts to preach on medical subjects to medical men must necessarily make blunders. The author makes the statement that 15 per cent. of physicians are addicted to the use of opium. Who is there in the profession who will not stigmatize this statement as extravagant? It must be admitted that the author, who is at the same time the proprietor of a sanatorium for the treatment of drug addictions, cannot be entirely disinterested when he makes the dogmatic statement, "The average sanatorium is merely a small colony of drug-users." A mere glance at the book's cover reveals, as the first line, "A REVELATION, A WARNING, A WAY OUT." This, of course, prepares the reader for some sensational reading. And the author has not disappointed us. After having censured the medical profession for their extreme ignorance and having called the sanatoriums mere money-making institutions and drug-colonies, the author has a slight premonition that some one might suspect, and he hastens to say: "Of course the general reader may think this book merely a clever advertisement. In it I state that it is wrong to stop the use of morphin and alcohol unless the victims can be treated for the habit, and next I condemn doctors and sanatoriums for their useless methods of treatment, while lauding my own. Naturally, my reader may assume that my only motive is the selfish one of money." Certainly, the assumption might be justified. Those of us who have had the opportunity to try it are convinced that the Lambert method of treating opium addiction is one of the best of the so-called rapid cures, but Mr. Charles B. Towns has not yet informed us who communicated to *him* the formula which he claims as his own.

T. B. PLAYING THE LONE GAME CONSUMPTION. By Thomas Crawford Galbreath. Paper. Price, 25 cents. Pp. 80, with 4 illustrations. New York: Journal of the Outdoor Life Publishing Company, 1915.

One of the difficult problems connected with the treatment of tuberculosis is to so inculcate in the mind of the patient the importance of strict adherence to the rules of the modern open air hygienic, dietetic treatment, etc., that the patient will single-mindedly, without deviation, carry out the essentials of the prescribed regimen and thus place himself on the road to recovery. An absolute conviction of the soundness of the regimen and the necessary self control on the part of the patient are important prerequisites of successful direction of each individual case. The tuberculous patient is particularly responsive to the lessons learned by others afflicted with the same disease. Mr. Galbreath tells of his

twelve years' experience as a tuberculous patient, "chasing the cure" in Colorado. It is a heart-to-heart talk with the tuberculous patient, placing great emphasis on the importance of early diagnosis and strict observance of the necessary regimen if an arrest of the disease is to be accomplished. The author protests against the too common practice of shipping West patients without sufficient means to carry out a regimen in which the factors of time and financial means are very important. The details of the open air regimen are given in very simple language, and the factors of rest and self control are thoroughly emphasized. Climate is given a subordinate place to hygiene, diet and close medical supervision, and treatment in a sanatorium is recommended to all who cannot "discipline themselves." The practice of sending West patients without adequate means is condemned in the following pointed sentences: "The community may consider it cheaper to pay one way fares to Colorado than to run a sanatorium for its own unfortunate consumptives. . . . It is inordinate selfishness, a kind of civic thievery, and downright cruelty to the ignorant and unsuspecting invalid." The author pleads for the elimination of the too prevalent phthisiophobia, which should have no place in the relationship with a careful tuberculous patient. This volume is an important addition to popular antituberculosis literature. Placed in the hands of every tuberculous patient, it will prove itself a great aid to physicians in the efficient control of individual cases. The cost of the book is very moderate and its circulation should be widespread.

TWELVE LECTURES ON THE MODERN TREATMENT OF GONORRHEA IN THE MALE. By P. Asch, M.D. Translated and Annotated by Faxton E. Gardner, M.D., Assisting Visiting Genito-Urinary Surgeon, New York Polyclinic. Cloth. Price, $1. Pp. 104, with illustrations. New York: Rebman Company, 1915.

The German edition of this book was reviewed in this department, Dec. 5, 1914. At that time attention was called to the fact that Asch's treatment is that of the French and German schools, and that American opinion differs on several phases, for instance, especially as to the injection method—more favored in America—as against irrigations, which are the choice abroad. This translation has been annotated by the translator with a thoroughness which makes the book more valuable. Practically every page contains footnotes calling attention to the different points in which the foreign method differs from the American procedures in treating this disease. This makes the book more valuable than the original.

Medicolegal

Implied Promise to Pay for Medical Services

(Bigelow vs. Hill (Minn.), 152 N. W. R. 763)

The Supreme Court of Minnesota affirms a judgment in favor of the plaintiff, a physician, for services rendered in the treatment of the defendant's niece, aged 14. It appeared that the girl's parents had been divorced, and that she had come to live with the defendant and his wife, on their farm. Not long afterward, the girl being very ill, the defendant's wife, with his consent, drove with her to the plaintiff's office, in a village 3 miles away. Mrs. Hill stated to the plaintiff that "her girl" was sick, and that she wanted him to see her. He diagnosed the case as one of blood poisoning, gave her a treatment then, and was given directions by Mrs. Hill how to reach the defendant's farm. She told the plaintiff to do everything necessary to the girl's recovery. She did not tell him that the girl was not her daughter, and he assumed that she was until his second visit to the farm, when he was told that she was the daughter of the defendant's brother. The plaintiff continued to attend and treat the case, and after the girl's recovery rendered to the defendant a bill for his services, which the defendant refused to pay, claiming that the debt was that of the girl's father. The defendant testified that the girl was employed as a servant in his family, but the trial court found that she was a member of his household. The defendant paid a bill for drugs and one for the services of a nurse.

It is true, the supreme court says, that the rule that, when one requests the performance of services by another there is an implied promise to pay for the services rendered, does not apply where a person requests a physician to perform services for a patient, unless the relation of that person to the patient is such as raises a legal obligation on his part to call a physician and pay for the services, or the circumstances are such as to show an intention on his part to pay for the services, it being so understood by him and the physician. It is also the law that a master is not ordinarily, in the absence of a contract obligation, liable for medical services furnished his servant, though furnished at the request of the master. And it is doubtless correct that the father would be liable for necessary medical attendance furnished his daughter, though the services are requested in his absence by another. But these rules do not necessarily control the decision of this case.

The defendant knew that his wife was taking the girl to see the plaintiff, and consented. There appeared to have been no thought then, or until the bill was presented, that the defendant would not pay the physician, just as he had paid the druggist and the nurse. It would have been easy to have informed the plaintiff that he would have to look to his patient's father for his pay, but he was allowed to render his services under the assumption that the girl was the defendant's daughter, or at least a member of his household whom he was supporting. Under these circumstances the trial court was justified in finding an implied promise by the defendant to pay for the services rendered.

Choice of Persons for Taking Roentgenograms

(International & G. N. Ry. Co. vs. Bartek (Tex.), 177 S. W. R. 137)

The Court of Civil Appeals of Texas, in affirming a judgment for $2,000 damages in favor of plaintiff Bartek for personal injuries sustained in a wreck, says that one of the assignments of error was based on a refusal of the trial court to compel the plaintiff to submit to having roentgenograms taken of his back, to be exhibited to the jury. But this court does not think that the trial court abused its discretion in this matter. The facts of the case did not bring it within the rule that, while a party has the right, in the first instance, to refuse to submit his person to an examination, yet by doing so, and being so examined by his own physician in the presence of the jury, he waives his privilege in this regard, and the opposite party is entitled to have a like examination made by his physician. In this case the plaintiff exhibited his back to the jury, and his physician pointed out thereon the evidence of the injury as he claimed it to be. A like examination was made, without objection, by the physician of the defendant, who denied that profert of the plaintiff's back furnished conclusive proof that one of his vertebrae had been fractured as was claimed by the plaintiff's physician. The evidence further showed that the defendant had been afforded an opportunity to have roentgenograms of the plaintiff's back taken by an alleged expert of Houston, who presumably was impartial in the matter, inasmuch as he was not personally known to the plaintiff or either of his counsel. The plaintiff's counsel at this time objected to having such pictures taken by a party in Waco, on the ground that they doubted his competency. This was some time before the trial. The Waco party referred to was the same party whom the defendant requested should be permitted to take such pictures during the trial. The plaintiff's counsel agreed that if the roentgenogram was taken by the Houston physician he would make no objection to its introduction in evidence. The introduction of a roentgenogram taken by an incompetent person might have proved prejudicial to the plaintiff. The Waco party may have been competent, but the plaintiff's counsel did not think so, and the court was justified in not compelling the plaintiff to have a roentgenogram taken by a party who was objectionable to him, when he offered to have such picture taken by a party whose competency and disinterestedness were not called in question.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, Chicago, Dec. 27-29.
American Physiological Society, Boston, Dec. 27-30.
Society of American Bacteriologists, Urbana, Ill., Dec. 28-30.
Southern Surgical and Gynecological Association, Cincinnati, Dec. 14-16.
Western Surgical Association, Des Moines, Dec. 17-18.

MINNESOTA STATE MEDICAL ASSOCIATION

Forty-Seventh Annual Meeting, held at Rochester, September 30 and October 1, 1915

(*Concluded from page 1675*)

Clinical Observations on Syphilitic Disease of the Heart and Aorta

DR. R. D. MUSSEY, Rochester: In 1,379 cases of syphilis, clear-cut syphilitic disease of the heart or aorta occurred in fifty-nine. Syphilis of the heart does not present a typical syndrome other than that of myocardial change, dyspnea being the chief complaint, and the signs of myocardial insufficiency with dilatation and hypertrophy the chief findings. Syphilis affects the aorta more frequently than the heart. In the aortitis group pain and dyspnea are the chief complaints with the signs of insufficiency of the valves. In the aneurysmal group, pain is predominant with the usual aneurysmal signs. Blood pressure is of value in the prognosis and an aid to diagnosis, especially in the aortitis group in patients with aortic insufficiency. Syphilis of the heart and mediastinum responds more readily to treatment than syphilis of the aorta. The use of potassium iodid and mercury seems to be of value, even when the patient is showing evidence of broken compensation; these may be followed by salvarsan and more especially by neosalvarsan with marked benefit in symptoms. Vigorous and persistent treatment will apparently arrest progress in certain aneurysmal cases.

DISCUSSION

DR. S. MARX WHITE, Minneapolis: The importance of the aortitis and aneurysmal group is very great, and we commonly learn to look on every case of aortic lesion with considerable suspicion, a suspicion justified in the majority of instances by the discovery of the evidences of syphilis. We have lesions in the aortic valves from rheumatic infections, but they are almost without exception accompanied by lesions in the other valves. We are learning to use the Wassermann reaction early, and the Roentgen ray to recognize early cases of aortitis. In connection with aneurysm, the medical profession ought to pay very much closer attention to the question of a thorough and painstaking and complete systematic examination of the patient.

DR. E. L. TUOHY, Duluth: There were twelve cases classed as cardiovascular. In three there was a diagnosis made of mesaortitis luetica. There were three cases of myocarditis, six of aortic aneurysm, and three cases that had syphilis had also valvular lesions due to that disease.

Open Air Treatment in Surgery

DR. J. W. MARKOE, New York: I selected 110 cases of sepsis and considered them under two main groups, namely, those that are treated in the open air and those treated indoors. In one group, the main therapeutic measure was the open air. In all but five of these cases, blood cultures taken by the usual technic under proper precautions and with appropriate mediums, demonstrated the presence of bacteria. The following organisms were recovered from the blood: hemolytic streptococcus in 94 cases; *Streptococcus viridans* in 1 case; pneumococcus in 2 cases; *Staphylococcus aureus* in 7 cases, and *Bacillus aerogenes capsulatus* in 1 case. In no case was more than one organism recovered from the blood. There were 16 cases of postabortive sepsis; 89 cases of postpartum sepsis, 67 of which were admitted from three to ten days or more after delivery, and 22 were admitted with labor in progress; also 5 cases of antepartum sepsis.

This last group of five cases is of interest, for in them even before the onset of labor, the sepsis was fully developed. Of these five cases, in one a sinus thrombosis was present; in two the sepsis followed operative interference; one incision of an abscess of the throat, and the other the removal of an appendix. In a fourth case the patient, on admission, had already a streptococcus meningitis, while a fifth case showed the presence of a general peritonitis for which no cause was found. Of these 110 cases, 42 were in the hospital less than five days with a mortality of 100 per cent.; 68 were in the hospital more than five days with a mortality of 66 per cent. Of the 110 patients, 53 were treated in the open air in addition to the other measures and 57 were indoor patients, of whom 55 died and 2 left against advice. Of the 53 cases treated on the roof, 17 were there less than five days and all died; 13 died that were there more than five days; 1 left against advice, and 22, or 42 per cent., recovered.

In these 22 cases, the following bacteria were present in the circulation: hemolytic streptococcus in 17 cases; pneumococcus in 1 case, and in 4 cases no organism was recovered. Of the cases on the roof more than five days there were 16 of the 21 without complications that recovered, whereas but 6 of the 14 showing the various manifestations of pyemia survived. Thus it seems that when no complications were present, the percentage of recovery was greater. Of the indoor patients, there was 100 per cent. mortality in the 21 cases that were in the hospital more than five days, while, on the other hand, there were 22 recoveries of the 35 treated on the roof more than five days.

In addition to these 110 cases we have treated innumerable cases in the open air where the infection was localized in the pelvis. Among these may be mentioned such cases as pyometritis, parametritis and the large inflammatory exudates commonly observed in the broad ligaments following labor. These patients seem to withstand high temperatures more readily, and they enjoy and assimilate their food better. Their facial expression changes after being on the roof for a few days, from one of despair to that of hope and assurance. The blood picture soon shows an increase in hemoglobin and red cells, which, however, coincides to a certain extent with the reduction of the temperature.

Local Anesthesia

DR. L. E. DAUGHERTY, St. Paul: By carefully questioning patients who have been operated on during the past year, to whom ether anesthesia has been administered, we have elicited the fact that what they most dreaded was not the operation itself, but rather the loss of consciousness and the resulting nausea and distress caused by the ether. Some on whom secondary operations were necessary have consented to return to the operating room only on the condition that local anesthesia be used.

DISCUSSION

DR. C. R. BALL, St. Paul: There is benefit in having the consciousness and aid of the patient. Having injected a great many cases of tic douloureux with alcohol, I am conscious of the great aid the patient is able to give in these operations.

DR. HARRY P. RITCHIE, St. Paul: I recall one case in which a suprapubic cystotomy was done on a diabetic under local anesthesia. This man was admitted with acidosis and acetonuria, and was practically comatose, yet I drained him suprapubically, after which he received medical treatment, and today he is a well man.

DR. R. E. FARR, Minneapolis: In foreign countries laminectomy has been done many times under local anesthesia. There they have found that the dura is extremely sensitive in contradistinction to the condition found in the skull. In one case which I had a few months ago, the patient, an intelligent man, talked with me all the way through the operation. In this case I turned up a wagnerian flap as large as my hand. It was impossible to put a needle through that flap of dura without the most intense pain referred to the eyes. I followed Lenander's work for a number of years, and I do not always agree with him. In a case of resection of the intestine, for instance, the patient had a sharp pain every time I put the needle through his intestinal wall, although no traction was made on the mesentery. Again, in some cases patients com-

ing in with a fair-sized ovarian cyst speak of pain on the right side, and give a history of chronic appendicitis. In these cases, by taking hold of the cyst, compressing its pedicle, and compressing the nesentery in various places, we have been able to deliver each of these organs without causing the pain for which the patients sought relief.

Varicose Veins

DR. D. C. BALFOUR, Rochester: The veins which are most commonly the site of varicosities are the hemorrhoidal, the spermatic and the long saphenous. It is usually a disease of middle life, although in our series several patients were under 25 years of age, and the ratio of male and female was 3:2. The etiologic factors most apparent were: (1) the occupation which necessitated the prolonged erect posture, and (2) the anatomic and physiologic factors present in veins in the lower extremities, which are important in that they afford opportunity for exciting causes to produce the condition. In 40 per cent. of this series there were chronic ulcers on one or both legs. The chronic congestion of the skin and subcutaneous tissue is a strong predisposing factor to the formation of the ulcer, and a very slight injury may be sufficient to produce a lesion resistant to healthy healing. If these ulcers are not treated, or the causative condition relieved, they increase steadily until they reach an enormous size; they are also subject to malignant degeneration. Preoperative treatment is occasionally advisable, particularly if there is ulceration, or in cases of recent phlebitis in which redness and pain, marking local thrombosis, still exist along the course of the vein. The most satisfactory method, in my experience, for the subcutaneous extirpation of a long saphenous, is that of C. H. Mayo. Of 256 patients, 161 were heard from. Of these, 68 were complicated with ulcer, 93 were without ulcer, and 39 (57.3 per cent.) of the 68 were cured, that is, the ulcer healed, the veins disappeared, and there was no swelling of the feet. Sixteen (23.4 per cent.) were greatly improved, the ulcer healed in the majority, with some of the patients complaining of swollen feet or aching of the legs after a long day's work. Eighty per cent. were either cured or improved, 13 (19 per cent.) were definitely unsatisfactory as regards results. Of the 93 cases without ulcer, 67 (73 per cent.) were cured, 16 (17 per cent.) improved, and 10 (10.5 per cent.) were unsatisfactory. In practically 90 per cent. of this group, good results were obtained. In no case had less than one and one-half years elapsed since operation.

The Prone Position and Its Uses

DR. M. M. GHENT, St. Paul: Pneumonia patients who are beginning to show signs of exhaustion, such as shortness of breath and cyanosis, are benefited by being placed on the stomach. This is especially true of children with bronchopneumonia. In this position the cyanosis is much less marked during the paroxysms of coughing, and the patient sleeps much better, because the breathing is easier. All of this convinces me that patients under conditions such as I have named above breathe poorly when they lie on their backs. This is especially true in babies because of their helplessness. It is also true of some patients who are unconscious from any cause. This has led me to believe that we keep our patients lying on their back too much; especially is this true after operations. My plan now is to let patients lie in any position in which they are most comfortable. Patients coming out from under an anesthetic are given pillows enough to make them comfortable.

Perforating Gastric Ulcer Following Gastro-Enterostomy

DR. ARTHUR N. COLLINS, Duluth: Gastro-enterostomy is not a curative procedure for all ulcers of the stomach. Simple gastro-enterostomy will not suffice where excision should be done. It does not revolutionize the patient's healing power per se. Postoperative medical care should be established in all cases until cumulative experience tells us where to leave it off. From the standpoint of the patient, simple gastro-enterostomy does not accomplish all that should be really expected of a fairly major surgical operation.

DISCUSSION

DR. WILLIAM J. MAYO, Rochester: It is true, gastro-enterostomy does not furnish the complete and satisfactory results in ulcer of the stomach that it does in ulcer of the duodenum. It is extremely fortunate that ulcer of the duodenum is so much more frequent than ulcer of the stomach. About 75 per cent. of all peptic ulcers are in the duodenum, and as long as the stomach itself is normal and the gastro-enterostomy is done on the functionating organ, a cure or at least very great improvement may be expected in as high as 90 per cent. of the cases. I know of no operation in surgery that gives more satisfactory results than gastro-enterostomy or an equivalent operation in ulcer of the duodenum. The failures of gastro-enterostomy that are due in the main to the operation are because the condition in the stomach may not be suitable for the operation; that is, the ulcer may be proximal to the gastro-enterostomy, and in such cases we cannot expect the gastro-enterostomy to cure the patient. In the second place, a gastro-enterostomy is done in many cases in which ulcer does not exist, based on the symptoms of the patient. No surgeon should do gastro-enterostomy for ulcer which cannot be demonstrated accurately at the time of the operation.

DR. A. C. STRACHAUER, Minneapolis: Gastro-enterostomy is no longer performed except when ulcer can actually be demonstrated. The ulcer is eradicated either by excision or by the actual cautery. The majority of men with experience in gastric surgery feel very much concerned as to the possibility of malignancy developing on an ulcer, and feel much easier in mind when the ulcer is eradicated either by excision or by the cautery.

AMERICAN ROENTGEN RAY SOCIETY

Sixteenth Annual Meeting, held in Atlantic City, N. J., Sept. 22-25, 1915

(Concluded from page 1670)

New Roentgen Evidence in Early Diagnosis of Gastric Carcinoma

DR. A. W. GEORGE, Boston: Chronic ulcer alone near the pylorus will not show a deformity or defect other than the classical Roentgen sign of ulcer. When the ulcer begins to undergo degeneration, the changes due to beginning malignancy can be demonstrated. It is what we have termed the annular deformity. This is ringlike in character, increasing the long diameter of the pyloric sphincter toward the antrum, and it is constant in all positions. This is a positive early sign of gastric cancer.

Roentgenologic Diagnosis of Duodenal Ulcer

DR. RUSSELL D. CARMAN, Rochester, Minn.: Though I would not place exclusive reliance on cap distortion for diagnosis, I consider this sign one of the best and well worth searching for in those cases in which more simple methods of examination fail to establish or exclude the presence of duodenal ulcer. Irregularities of the duodenal outline are not pathognomonic of ulcer. Some ulcers do not produce an organic distortion which may be demonstrated roentgenographically, while irregularities of the duodenal contour may sometimes be produced by pericholecystitis and other adhesion-producing lesions, or by spasm reflected from distant sources. Deformity due to such causes is much less common than deformity resulting from duodenal ulcer. Deformity of the bulb and spasm arising from distant sources is more often lacking in persistence and permanency of situation. Deformity, when present as a result of ulcer, is more likely to be constant. While some duodenal ulcers produce a scar, distortion of the duodenal lumen, which can readily be seen on the roentgenogram in other organic deformity, is so slight that it cannot appreciably distort the barium shadow. This is especially true of small mucous or slit ulcers. If bulbar distortion is the result of the intrinsic spasm, the administration of an antispasmodic, such as belladonna, may relax the spasm and cause the deformity to disappear. This is still under investigation. Since using the serial method, our diagnosis of duodenal ulcer has been confirmed at operation with fewer exceptions than before, and fewer ulcers have

escaped diagnosis. We have not limited ourselves to this method, but have added it in certain cases of suspected ulcer to our routine screen and plate examinations, because it is not always necessary to make multiple plates. Hypertonus, hypermotility and hyperperistalsis are most valuable indications of duodenal ulcer. These phenomena are seen in various combinations, and often all together. Hypertonus is seen in the majority of duodenal ulcers, perhaps more frequently in this than in any other condition. Gastric hyperperistalsis is notable in a large proportion of the cases, perhaps 60,000 or more. Hypermotility is the logical result of hypertonus and hyperperistalsis. More than one quarter of these ulcers are certainly obstructive and produce a six-hour retention. In testing motility, our modification of Haudek's double meal method is an indispensable part of our routine. A six-hour retention in the stomach, with an unbroken contour, ought, first of all, to suggest duodenal obstruction, and the most common cause of this is duodenal ulcer. If there is typical gastric hyperperistalsis, the presence of duodenal ulcer is well-nigh certain.

DISCUSSION OF PAPERS BY DRS. GEORGE AND CARMAN

DR. LEWIS G. COLE, New York: Dr. Carman referred to duodenal ulcer, gallbladder adhesions and spasm as being causes of the wave defect in the cap. That is true, but the first two cause permanent organic filling defects and the latter does not. In the case of duodenal ulcer and gallbladder adhesions, the indications for surgical treatment are the same. Some cases of spasm cannot be diagnosticated. I have made a diagnosis of ulcer when it was a case of spasm. In the past year I have seen two cases of adhesive membrane involving the cap that caused a filling defect, which might lead one to diagnose duodenal ulcer. There may be a great deal of deformity with very few symptoms. We should not make the diagnosis too positively. When we find an induration, we should say so, and advise surgical intervention.

DR. GEORGE E. PFAHLER, Philadelphia: We should make as nearly a definite diagnosis as possible. If we believe it is carcinoma, we should say so, because otherwise the patient will not be operated on. We leave the surgeon in doubt. On the other hand, we must not state anything definitely that is not there. Dr. Carman presented as nearly the truth on the question of duodenal ulcer as we are able to state it today.

DR. FREDERICK H. BAETJER, Baltimore: Spasm is more or less transitory. Two cases came under my observation that are worth mentioning. A girl of 18, with indefinite stomach symptoms, had a filling defect of the greater curvature. The same defect was present on the following day. At the end of a week and at the end of two weeks it was still present, and, finally, it was decided to operate on her. The stomach was normal. Absolutely nothing was found to account for the deformity. Even an examination of the inside of the stomach was negative. A second patient came in with a definite roentgenologic diagnosis of carcinoma, made by a competent roentgenologist. The patient was operated on, but nothing was found. The roentgenograms were reviewed and still the diagnosis of carcinoma of the stomach was made. Six months later another examination was made, with the identical results. We gave the patient atropin for two or three days, and the next examination showed a normal stomach outline. We now employ atropin as a routine, giving from $\frac{1}{100}$ to $\frac{1}{120}$ grain two or three times a day until the patient begins to feel dry. In one or two obscure cases it has helped me out very much.

DR. W. F. MANGES, Philadelphia: As we now have apparatus that can be used safely for fluoroscopic work, we should extend the examination in these cases beyond the stomach and duodenum, including the entire gastro-intestinal tract, in order to discover other lesions that may be present. That is particularly true of the lower small bowel and the appendix region, where lesions may be overlooked by the surgeon when he is operating for gastric or duodenal ulcer.

DR. GEORGE C. JOHNSTON, Pittsburgh: I have never had any trouble in getting surgeons to accept help in diagnosis. I remember a case of a woman, aged 60, in which the report was early carcinoma of the stomach. The surgeon operated and found the pylorus normal in appearance. He palpated the pyloric region carefully, and did a resection and a posterior gastro-enterostomy. After very careful palpation of the pylorus he had felt an annular ring. There was no erosion of the mucosa—just a little constriction or tightness. The pathologist reported adenocarcinoma. In this case the Roentgen evidence of the disease was responsible for finding the carcinoma. Therefore, I am going to continue to say to the surgeon that, to the best of my knowledge and belief, a careful exploratory operation is justified.

DR. WM. H. STEWART, New York: In a case of carcinoma with annular deformity the surgeon hesitated to admit that it was a cancer, and claimed that it was an ulcer. I insisted on a pylorectomy, and on microscopic examination the tumor proved to be a carcinoma of the pylorus. That was the third case of the kind I have had.

CHICAGO MEDICAL SOCIETY

Regular meeting, held Oct. 27, 1915

The President, DR. CHARLES F. WHALEN, in the Chair

SYMPOSIUM ON LEPROSY

The Fear of Leprosy

DR. E. L. MCEWEN: The fear of leprosy arises from erroneous conceptions of the disease; but this fear exists as a definite social factor which is operative to the detriment of occasional victims of the disease in this country. Every physician should take a firm and true stand with regard to leprosy, in order that the lay mind may view the disease more rationally, so that the persecution of lepers when they are discovered shall not occur. This means a campaign of education by every physician with his patients and with his friends in the direction of enlightening the people as to what true leprosy is and the great difficulty of contagion.

Clinical Description of Leprosy

DR. OLIVER S. ORMSBY: The clinical picture presented in leprosy depends on whether the integumentary or the nervous system is wholly or chiefly invaded by *Bacillus leprae*. No definite time limit exists between the time of infection and the development of symptoms. It is variously estimated from a period of many weeks to several years. From the time of infection until the eruptive manifestations occur, various prodromes are frequently noted. These differ in no way from those occurring in any other infectious process. The lesions in the eruptive type of the disease may occur on any part of the body. In the anesthetic variety the symptoms exhibited in the part supplied by the affected nerves are those which would naturally follow their irritation, compression or degeneration. The prodromes and macular stage of this variety may be severe or be altogether absent.

Pathology and Bacteriology

DR. FRED G. HARRIS: Over seventy attempts have been made to transmit the disease in man by inoculating leprous material from one individual to another, only one, that of Arning, being successful. The bacilli are much more frequently found in the nasal secretion of cases of long standing than in early ones. The bacilli are not often found in the nasal secretions of healthy persons who are in intimate contact with lepers. The most common atrium would seem to be through the skin, for a large majority of the cases give a history of the disease commencing on the extremities. In a series of 275 cases the disease began on the feet in 58 per cent., and on the hands in 11.2 per cent. The infection is disseminated by the blood stream.

Sanitary Aspects of Leprosy in the United States

DR. WILLIAM ALLEN PUSEY: Leprosy in North America is limited to a few foci. There has been a focus of leprosy at Tracadie, N. B., for nearly a hundred years. According to Dr. A. C. Smith, leprosy in that district can be definitely traced to one case introduced from Normandy in 1815.

Numerous cases have developed subsequently in that district. The living conditions are hard and the people poor, and there is a lazaretto there containing twenty-six beds. As a result, however, of partial segregation and better living conditions of the people, few of the beds are now occupied, and leprosy is rapidly diminishing in that district. Many cases have been introduced into Minnesota and the other Middle Northwestern States by Scandinavian immigrants. In 1900, according to Bracken, eleven cases of leprosy were known in Minnesota, and in 1903 no new cases had been reported. A few cases of leprosy exist along our Mexican frontier among Mexicans. These have practically been uncontrolled without spread of the disease beyond these people. There has always been a considerable number of lepers in New York, and there are always probably one or more in the Chicago district. These have always been foreigners, and no case has been known to originate in either place. In New York the number is estimated as high as 100, but there has never been any effort to segregate them. They have been admitted freely to the public hospitals. The chief foci of leprosy in the United States are in Louisiana and in Key West. The experience of civilized people in other parts of the world in respect to leprosy corresponds to that of the United States in regard to its slight infectivity. Where leprosy is endemic the situation is different, and public protection requires that practical —not absolute—segregation should be carried out. In districts like Louisiana, where leprosy is active, every effort should be made to segregate lepers as completely as possible.

To that end public asylums of refuge should be provided for them, as has been done in Louisiana. The establishment of a national sanatorium for lepers is advocated by the surgeon-general of the U. S. P. H. S. Federal care and control is undoubtedly the solution of the comparatively simple sanitary problem of leprosy in the United States, and should be insistently advocated by medical organizations, and other organizations within whose purview come matters of public health.

Discussion on Leprosy

DR. DAVID LIEBERTHAL: According to the historical review of pre-Bible times, there were records of leprosy in the papyri of the Egyptians thousands of years before the Bible, leprosy having prevailed around the region of the Nile from which it spread over Europe. In the middle ages, leprosaria or asylums for lepers increased in great numbers. One could imagine conditions in these asylums under which victims of the disease were huddled together and the manner in which they were taken care of, being subject to reinfection, and yet, with the advent of syphilis, it was noted that leprosy was on the wane. The number of cases was materially decreasing. I believe this decrease was due to the acquirement of a certain immunity. Leprosy is not altogether incurable. The hygienic and dietetic methods of treatment are the same as for any other disease. Lepers suffer from what is known as heat hunger; consequently they ought to be kept warm. They should be given baths. In some countries, as in Japan, lepers are sent to mineral springs and kept there for a long time. If patients cannot be sent to hot springs, plain baths can be given. If there are nodes, Unna suggests they be ablated, cut off flat with a sharp knife or razor until blood begins to flow, and their bases cauterized, and medicinal applications made which consist of remedies of the phenol group, especially pyrogallic acid and resorcin. This is rubbed in and the places covered over with plaster. As a remedy for use internally, I would mention chaulmoogra oil. The leper should be kept under constant observation. It would be a step in advance if the federal government established a colony or home for the lepers of the United States, to which they could go voluntarily and be assured they would be cared for properly.

DR. O. S. ORMSBY: I heartily endorse the recommendation concerning the establishment of a leper home and of placing the victims of this disease under federal control.

DR. W. A. PUSEY: I recommend that the society express its approval of the establishment of a leper home under the control of the federal government as recommended by Surgeon-General Blue of the U. S. Public Health Service.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

November, X, No. 5, pp. 313-396

1 *Etiology of Tetany — Metabolic and Clinical Studies. A. Brown and A. Fletcher, Toronto.
2 *Ductless Gland Therapy. R. S. Haynes, New York.
3 Spinal Fluid in Poliomyelitis and Its Differentiation from Fluids of Other Infections. H. L. Abramson, New York.
4 *Clinical Study of Children in Relation to Tuberculous Exposure Controlled by Von Pirquet Reaction. J. B. Manning and H. J. Knott, Seattle.
5 Congenital Malformation of Intestine. L. M. Drennan and H. C. Clark, Ancon, Canal Zone.
6 Intestinal Parasites in Children. G. J. Greil, Montgomery, Ala.
7 Polycystic Disease of Kidney in Infant Three Months Old. J. S. Leopold and M. B. Künstler, New York.

1. **Tetany.**—It was Brown and Fletcher's object to see that if by changing the various food elements, tetany could be produced with a fair degree of certainty, and to note any change in the inorganic salts during the onset, height and curing of the condition and what substances were responsible for the ultimate healing. Their observations were made in thirty cases of definite tetany; and 100 infants thought to be free from tetany were carefully tested, electrically and mechanically, for any evidence of spasmophilia. They found that tetany may be produced by high carbohydrate foods which have been subjected to heat up to or over the boiling point. The monthly incidence of tetany is probably due to a disturbance of the gastro-intestinal tract (constipation), decreased internal combustion and the comparative safety from diarrhea in feeding high carbohydrate foods during the cold months. A diagnosis of tetany is suggestive when there is manifest kidney inactivity in constipated infants fed heated foods of high carbohydrate content. As a result of this improper feeding there is produced a disturbance of the body salts. At the height of the disease there is an almost complete retention of sodium and potassium (the irritating salts) and a great loss of magnesium. As improvement ensues there is an increased flow of urine accompanied by a relief of the constipation, during which the stored up sodium and potassium are rapidly lost. This salt disturbance may be remedied first by purgation, second by diuresis, third by the administration of cod liver oil and phosphorus to build up the calcium content, and fourth by a change of diet. The severe spasms or convulsion may be temporarily relieved by subcutaneous injections of a solution of magnesium sulphate.

2. **Ductless Gland Therapy.**—This contribution has to do with the action of the pars intermedia of the pituitary gland. These particular activities of the gland, from a therapeutic standpoint, have become apparent through a study of an abnormal child carried on for the past two and a half years by Haynes, and previously by several physicians connected with the dispensary of the Babies' Hospital, including Drs. Kerley and Van Ingen. It seems evident in this case, that, assuming a deficiency of thyroid as evidenced by the condition when first coming for treatment, there was also an affection of the pituitary; that this affection of the pituitary partook of the nature of a deficiency of the pars intermedia, and that the exhibition of pars intermedia improved the condition in unexpected ways. It was interesting in following the unfolding of this case to see 1. Symptoms which might rationally have been considered to be due to hypothyroidism clear up with the exhibition of pars intermedia. 2. The remarkable effect which the exhibition of this lobe had on the smoothness, texture, and color of the skin and its warmth. 3. The striking changes in contour of hands, ankles, hips, shoulders, thighs, etc., changes which could be made to come or recede with giving or taking away of the gland.

4. **Tuberculosis.**—There are 166 children out of the 288 examined by Manning and Knott who have been or still are living in intimate contact with active adult cases. In the remaining sixty-two there is no known exposure. These adult contacts, in most instances, one or the other parent, in a few instances both parents, or older brothers or sisters,

are in the stage of lung invasion in varying degrees of activity. There are eighty-four of the 166 children with a definite history of exposure who give a positive von Pirquet test, or about 50.6 per cent. Of this number the largest part, sixty-nine, or 81.2 per cent., show no clinical evidence of tuberculosis. There are fifteen children, representing 17.8 per cent. of those children exposed to tuberculosis, who give a positive reaction and clinical evidence of tuberculosis. They show varying degrees of activity and types of infection, including seven cases of bronchial gland tuberculosis, one active keratitis, two with cervical adenitis, four with distinct lung invasion, and one with tuberculous peritonitis. One inactive, clinically nontuberculous child developed an active tuberculous peritonitis under observation.

Most of those diagnosed as bronchial gland tuberculosis are children with a distinct history of not doing well, with subnormal or slightly elevated temperature, frequently complaining of pain in chest or back, poor appetite, weakness or listlessness, with dilated chest veins, but no physical evidence of tuberculosis except sometimes paravertebral dulness. Roentgenograms showed corresponding shadows about the right hilus. There were eighty-two children with a definite history of exposure who gave a negative von Pirquet. This represents about 49.3 per cent. who give negative reactions out of the total 166 exposed to tuberculosis. One of these children gives distinct clinical evidence of tuberculosis, in which instance, as would be expected, the process has advanced to the third stage. There are eight in whom one of the authors recorded questions of finer shades of harsh breathing. In view of the fact that cutaneous reaction is negative in the presence of measles, it is stated that none of these children had measles at this time or within recent date. Sixty-two children were brought to the clinic because of poor nutrition, or by fear that something of the nature of tuberculosis might be present, rather than because of any known exposure. Fourteen of these sixty-two children, or about 22.5 per cent., give a positive von Pirquet, the remaining forty-eight, or 77.4 per cent., give a negative test.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

October, LXXII, No. 4, pp. 577-768

8 *Reappearance of Menstruation after Childbirth. H. Ehrenfest, St. Louis.
9 Serum Skin Test for Pregnancy and Different Pathologic Conditions. J. Bronfenbrenner, J. R. Freeland and M. J. Schlesinger, Pittsburgh.
10 Two Cases of So-Called "Missed Labor." S. P. Warren, Portland, Me.
11 Drainage and Dressing. H. S. Lott, Winston, N. C.
12 Relation of Pelvic to Abdominal Surgery. H. G. Wetherill, Denver.
13 *Tuffier's Ovarian Craft. W. A. Norton, Savannah.
14 Unilateral Impairment of Kidney in Toxemia of Pregnancy; Report of Cases. T. W. Buschmann, Philadelphia.
15 After-Results of Curetment of Uterus. J. H. Girvin, Philadelphia.
16 Intranasal Treatment of Dysmenorrhea; Report of Cases. C. A. O'Reilly, Philadelphia.
17 Case of Mercurial Poisoning from Vaginal Douche. E. Foskett, New York.
18 Case of Tuberculosis of Urachus. J. R. Eastman, Indianapolis.
19 Case of Chorio-Epithelioma Uteri with Large Bilateral Lutein Cystomata of Ovary. E. Schwarz, New York.
20 Outlet Pelvimetry; New Pelvimeter for Measuring Transverse and Posterior Sagittal Diameters. G. H. Pierce, New York.
21 Primary (Celoic) Prolapse of Vagina with (Traction) Elongation of Cervix Versus Prolapse of Uterus. A. B. Keyes, Chicago.
22 Sterility; Causes and Treatment with Original Stem Pessary. C. H. Judd, Detroit.
23 Developmentally Deficient Children Twice Born to Same Couple. W. C. Gayler, St. Louis.

8. **Reappearance of Menstruation After Childbirth.**—From the results of Ehrenfest's statistical study of the problem of lactation amenorrhea it seems that clinical experience evidently sustains the following views: A debilitating influence exerted immediately by labor and later by the loss of body fluids during lactation with rare exceptions temporarily arrests ovulation. As soon as the disturbed equilibrium is restored the ovary resumes its function of ovulation, and the first corpus luteum sends its specific hormone to the endometrium. The response of the latter probably to a certain extent is dependent on the anatomic condition of the uterus. If normal, a typical menstrual flow ensues; if subinvoluted or for other reasons hyperemic (retroflexed), the reaction may be unusually strong; on the other hand, if the uterus is in an atrophic condition, it may require the stimulations from more than one ovulation until it becomes anatomically restored to the degree of resuming its function. As a rule, menstruation continues practically regularly during lactation when once reestablished. The debilitating effect of lactation is obviously dependent on the general condition of the woman. Therefore, usually the disturbance in the equilibrium of body fluids ends sooner and menstruation reappears earlier in the strong and healthy woman. For the same reason the amenorrheic state in general will last longer in the sick or weak woman, in the primigravida, whose labor as a rule is longer and more exhausting, and in the woman suckling a large child. But in the majority of women the equilibrium is regained before they have actually ceased to nurse their children, and, therefore, in the majority of instances menstruation reappears before the function of lactation is ended.

13. **Tuffier's Ovarian Graft.**—Norton recommends this method for diseases of the ovary. He says it should always be done in idiots, defectives and criminals instead of double oophorectomy. It may also be done in those cases which one wishes to sterilize on account of contracted pelves and other conditions which render child-bearing impossible. Except for the fact that it does not allow pregnancy it fulfils all the requirements of an ideal operation. It can be easily and quickly done. The functions of the ovary, both in internal secretion and menstruation are maintained, and at the same time the ovary is placed in a clean healthy bed completely protected from subsequent attacks of gonorrheal infection. With a new and diminished blood supply sclerosis and cystic degeneration are prevented or retarded.

American Journal of Orthopedic Surgery, Philadelphia

October, XIII, No. 2, pp. 179-344

24 Arthritis Urica. G. R. Elliott, New York.
25 *Quiet Hip Disease. H. L. Taylor and W. Frieder, New York.
26 *Osteochondritis Deformans Juvenalis (Perthes' Disease). N. Allison and E. F. Moody, St. Louis.
27 Limitations of Roentgen Ray in Diagnosis of Certain Bone and Joint Diseases. A. Cotton, Baltimore.
28 Association of Static Disturbances in Children. D. P. Willard, Philadelphia.
29 *Resection of Transverse Process of Fifth Lumbar Vertebra for Relief of Painful Back. W. Blanchard and C. A. Parker, Chicago.
30 *Study of Juxta-Articular Sarcoma. P. W. Roberts, New York.
31 Mechanically Unfit; Study of Type Forms in Chronic Invalids. L. T. Swaim.
32 *Case of Typhoid Spine with Necropsy Findings. J. T. Rugh, Philadelphia.

25. **Quiet Hip Disease.**—Taylor and Frieder have noticed that certain cases of hip disease, beginning usually in the second quinquennium, run a mild course and progress to an excellent recovery with little or no treatment. These occur in children of good constitution, and in good physical condition, which is not impaired by the hip affection. The invasion is usually mild and insidious, beginning with a slight lameness and often without pain, though moderate pain in the hip, knee or groin is common at some stage of the trouble, and night cries occasionally occur. The child is seldom laid up and usually continues fairly active and goes to school. The authors have observed and studied nineteen cases of this disease, thirteen males and six females; the age at invasion ranged from 4 to 16. In twelve the right, in six the left and in one both hips were affected. In two other cases the roentgenogram showed some thickening of the neck of the second hip, but there were no symptoms. In none of the eight cases tested was there a positive Wassermann. Two patients were tested with tuberculin and both were negative. About half the patients were questioned as to indigestion and constipation, which was always denied. Several of the patients were treated at first for rheumatism; later, most of them were treated by the short spica for varying periods of time; a few had braces, or traction in bed; a number had no treatment. Treatment seemed to exert no effect on the symptoms or course of the disease, except that after immobilization of the hip, pain disappeared in several instances. The only cases of marked stiffness encountered were two boys who

had worn spicas for a considerable time; in both of them motion returned. Several of the cases were obviously overtreated and it seems that mechanical treatment is often unnecessary and only moderate restriction of activity advisable. Occasionally, if pain and spasm on motion are present, the short spica for a month or two seems beneficial. Operations are to be avoided. The name "quiet hip disease" is proposed for this clinical entity, the origin of which is as yet uncertain but the recognition of which is easy and important.

26. **Osteochondritis Deformans Juvenalis.**—Allison and Moody are inclined to believe that osteochondritis deformans juvenalis is a disturbance of the line of epiphyseal growth, and that it depends for its typical development on changes in circulation which destroy the balance which exists between the metaphysis and epiphysis in growing bones.

29. **Transverse Process of Vertebra.**—Blanchard and Parker cite a case of impingement of the transverse process of the fifth lumbar vertebra on the posterior wing of the ilium, producing pain, numbness and paralysis of the side and leg, so severe as to cause the patient to become bedridden.

30. **Study of Juxta-Articular Sarcoma.**—Roberts urges that a routine examination be made of cases presenting the symptoms of tuberculosis of the vertebrae or of the bones forming the hip and knee joints and that it should include a search for localized tenderness, pain at the site of the lesion, and careful scrutiny of roentgenograms for peculiarities in the picture. Localized pain in the diseased area which in an early case is unrelieved by immobilization is significant of some pathologic process other than tuberculosis. The appearance of unusual shadows in roentgenograms of a clinically tuberculous osteitis is sufficient reason for withholding a positive diagnosis of tuberculosis. Rapid bone changes shown by roentgenogram taken at frequent intervals are suggestive of sarcoma. The disappearance of pain when a part is immobilized, especially when the hip is concerned, does not exclude sarcoma, even though persistent pain in spite of immobilization argues strongly in favor of it. Localized tenderness about the area of disease, especially in spine and hip cases, may be regarded as confirmatory evidence of sarcoma if other factors point in this direction. Age of the patient, a history of local injury and the presence of tuberculosis in the family or in the patient, are features of little significance in arriving at a differential diagnosis between bone sarcoma and tuberculosis. A previous history of malignant disease relieved by operation should immediately suggest malignancy in the case under consideration. The possibility of sarcoma should always be borne in mind in clinically tuberculous joint conditions exhibiting unusual features. A diagnosis of sarcoma should not be made on any one symptom, but on the coexistence of several factors not usually present in tuberculosis.

32. **Case of Typhoid Spine.**—A portion of the bodies of the second, third and fourth lumbar vertebrae on the ventral surface was excised in Rugh's case. The intervertebral disk between the third and fourth lumbar vertebrae was missing and apparently replaced by a bony overgrowth that closely resembled, grossly, the bony tissues of the vertebral bodies. Sections cut from this point for microscopic study show a complete absence of cartilaginous tissue and a marked overgrowth of, or rather a replacement with, dense connective tissue, which has a rather rich blood supply. This connective tissue bridges the space normally occupied by the intervertebral disk and merges into the body tissue of the body of the third lumbar above and the fourth lumbar vertebra below, sufficient to cause a complete ankylosis.

Annals of Surgery, Philadelphia

October, LXII, No. 4, pp. 385-512

33 Typhoid Perforation. (To be continued.) J. H. Gibbon, Philadelphia.
34 *Treatment of Joint Infections by Lavage and Direct Medication. J. W. Churchman, New Haven, Conn.
35 Acute Gangrene of Gallbladder Following Injury. J. L. Ransohoff, Cincinnati.
36 Situs Viscerum Inversus with Gallstones. H. W. Horn, Wichita, Kan.
37 Carcinoma of Small Intestine. F. H. Lahey, Boston.
38 Dilatation of Duodenum. W. H. Barber, New York.
39 Surgical Physiology of Colon. J. M. Lynch, J. W. Draper, New York, and T. W. Lyon, New Haven, Conn.
40 *Triangle of Petit in Kidney Surgery. H. Crouse, El Paso, Tex.
41 Operative Treatment of Tumors of Bladder. J. A. Gardner, Buffalo.
42 Suprapubic Prostatectomy in Two Stages. J. Wiener, New York.
43 Case of Primary Tuberculosis of Prostate Gland. I. S. Koll, Chicago.
44 Pathologic Lesions Observed in Posterior Male Urethra by Means of Urethroscope. A. L. Wolbarst, New York.
45 *Mode for Ventrofixation of Uterus for Relief of Prolapsus. J. O'Conor, Buenos Ayres.
46 Tendon Fixation in Infantile Paralysis. W. E. Gallie, Toronto, Canada.
47 Corrective Otoplasty; Report of Two Cases. J. W. Downey, Jr., Baltimore.

34. **Treatment of Joint Infections.**—Churchman has treated by the method of repeated joint irrigation with salt solution followed by staining of the synovial membranes with gentian violet, a small number of streptococcus and gonorrheal joints. The irrigations are carried out under local anesthesia. The first distention of the joint, before anesthesia can be regarded as established, causes no pain or discomfort whatsoever. The strength of gentian violet used for this purpose has been 1:1,000. Gentian violet in this strength caused no pain or signs of subsequent irritation. In some cases the dye was used in a strength of 1:500. The number of cases treated is small, but, Churchman says, some of them have put the method of lavage and staining to a rather severe test. The results have been sufficiently encouraging to justify a continuance of a study, which is now being carried on in the laboratory of surgery at Yale University and in the wards of the New Haven Hospital. A detailed report is promised later.

40. **Triangle of Petit in Kidney Surgery.**—Crouse's paper deals with a new route for kidney surgery, which, in his experience, has been successful in most pathologic conditions met while dealing with the kidney in a surgical way, and is denominated the triangle of Petit route. By this route the author has removed even a 14-inch kidney, which has been practically destroyed by suppurative degeneration secondary to calculi, and was compelled to cut only slightly the internal and external oblique to gain additional space. On the right side this route can be used for doing appendectomies, and for inspection of the gallbladder and duodenum. The left-sided incision gives access to the tail of the pancreas, the spleen and the splenic flexure of the colon. Crouse has used the triangle of Petit route in over thirty kidney operations in various forms of renal pathology; in several cases the duodenum has been inspected, the upper fourth of which is readily brought to view, when the retroperitoneum is opened and retracted with Payr's broad-bladed retractor or the silver malleable retractor so commonly used for exposing deep cavities. The gallbladder can be drained and even removed, as was done by the author in the case of an old person suffering with a gangrenous condition of the gallbladder. When the lateral position is maintained in bed after operation, this incision gives an ideal line for drainage.

45. **Ventrofixation of Uterus for Relief of Prolapsus.**—The operation described by O'Conor endeavors to restore the cervix to its position by fixing it to the recti muscles in the following manner: The abdomen is opened by the usual low central incision and the uterus exposed, any coexisting adnexal disease or adhesions are dealt with, the uterus is then drawn well up into the wound, and a transverse incision is made through the uterine peritoneum just above and parallel to the uterovesical peritoneal reflection (corresponding to the preliminary uteroperitoneal incision in hysterectomy). The peritoneum, with bladder, is reflected downward and forward until a space about 1 inch square is left denuded on the anterior surface of the cervix. The uterine peritoneum on each side of exposed area is retracted and three strong (eleven day) catgut sutures are passed, about ⅓ inch apart, through the exposed portion of the cervix, and sufficiently deep to obtain a firm grip of the cervical muscular coat. The ends of the sutures are drawn out on each side, respectively, through the recti muscles by a Childe's ligature forceps. Thus the peritoneum is excluded

and the denuded surface of cervix is brought into direct apposition with the recti. In order to avoid subsequent intestinal adhesions at the site of fixation, the parietal wound is closed by tier sutures, the first suture purposely including the uterine peritoneum well above the denuded area.

Arizona Medical Journal, Phoenix

October, III, No. 10, pp. 1-11

48 Nervous Disorders Associated with Pelvic Diseases. G. H. Moody, San Antonio, Tex.
49 Tuberculous Meningitis; Prevalence in Children of Communities Frequented by Tuberculous Health Seekers. R. E. Thomas, Phoenix.
50 Syphilis of Nervous System. H. P. Mills, Phoenix.

Arkansas Medical Society Journal, Little Rock

October, XII, No. 5, pp. 115-137

51 Determinants of Medical Progress. A. C. Shipp, Little Rock.
52 State Hospital for Nervous Diseases. F. B. Young, Little Rock.
53 Diagnosis and Treatment of Incipient Tuberculosis. S. J. Wolferman, Fort Smith.
54 Abscess of Umbilical Vein. E. E. Barlow, Dermott.
55 Posterior Deviations of Uterus. W. B. Center, Garland.

Boston Medical and Surgical Journal

October 28, CLXXIII, No. 18, pp. 647-684

56 Nontuberculous Cases in State Sanatoria. E. Washburn, Rutland.
57 Errors in Diagnosis of Chronic Pulmonary Disease. J. B. Hawes, 2d, Boston.
58 What Constitutes Tuberculosis in Childhood? J. L. Morse, Boston.
59 Shrapnel Bullet in Bladder; Report of Case. D. P. Penhallow, Boston.

Colorado Medicine, Denver

October, XII, No. 10, pp. 281-314

60 Anatomic Consideration of Tumors of Brain with Special Reference to Gliomata. W. T. Councilman, Boston.
61 Record Sheets for Narcotic Drug Book. F. R. Spencer, Boulder.
62 Malingerer. W. M. Ogle, Trinidad.

Iowa State Medical Society Journal, Des Moines

October, V, No. 10, pp. 391-466

63 Influenzal Meningitis; Report of Case. F. A. Ely, Des Moines.
64 Peritonitis. O. J. Fay, Des Moines.
65 Tender Pylorus with Ptosis. E. Grimes, Des Moines.
66 Vaginal Cesarean Section; Report of Four Cases. L. E. Kelley, Des Moines.
67 Fibroma of Stomach. W. McCarthy and D. J. Glomset, Des Moines.
68 Abdominal Pregnancy; Report of Case. H. A. Minassian, Des Moines.
69 Mercury in Brain Syphilis. E. R. Posner, Des Moines.
70 Pregnancy and Tuberculosis. A. C. Page, Des Moines.
71 Sympathetic Ophthalmia. W. W. Pearson, Des Moines.
72 Childhood Susceptibility to Tuberculous Infection. J. H. Peck, Des Moines.
73 Chorio-Epithelioma; Report of Unusual Case. J. C. Rockafellow, Des Moines.
74 Mesenteric Cysts. F. Rosenbladt, Des Moines.
75 Direct Implantation of Motor Nerve on Muscle Tissue (Neurotization). A. Steindler, Des Moines.
76 Congenital Hypertrophic Stenosis of Pylorus; Report of Three Cases. J. T. Strawn, Des Moines.
77 Cerebral Abscess, Probably Primarily Due to Suppurative Tonsillitis. T. B. Throckmorton, Des Moines.

Journal of Biological Chemistry, Baltimore

October, XXII, No. 3, pp. 433-568

78 Spectographic Study of Amino-Acids and Polypeptids. P. A. Kober, New York.
79 Physiologic Action of Some Protein Derivatives. Are Proteoses Prepared from Zein and Gliadin Physiologically Active? F. P. Underhill and B. M. Hendrix, New Haven, Conn.
80 Id. Relation of Racemization to Physiologic Action of Proteins and Proteoses. F. P. Underhill and B. M. Hendrix, New Haven, Conn.
81 Id. Physiologic Action of Vaughan's "Crude Soluble Poison." F. P. Underhill and B. M. Hendrix, New Haven, Conn.
82 *Does Fat Formation Occur in Perfused Kidney? F. P. Underhill and B. M. Hendrix, New Haven, Conn.
83 *Character of Water-Soluble Nitrogen of Some Common Feeding Stuffs. E. B. Hart and W. H. Bentley, Madison, Wis.
84 *Effect of Pituitary Substance on Egg Production of Domestic Fowl. L. N. Clark, Ontario, Canada.
85 Ash of Clam Muscle in Relation to Its Osmotic Properties. E. B. Meigs, Woods Hole, Mass.
86 *Studies in Carbohydrate Metabolism. Influence of Hydrazin on Respiratory Quotient and on Heat Production. F. P. Underhill and J. R. Murlin, New York.
87 Determination of Bile Salts in Urine by Means of Surface Tension Method. G. D. Allen, Minneapolis.
88 *Criticism of Bang and Lewis-Benedict Methods for Estimation of Blood Sugar. R. G. Pearce, Cleveland.
89 Influence of Alkaloidal and Other Narcotic Poisons on Reductase. D. F. Harris and H. J. Creighton, Swarthmore, Canada.
90 *Quantitative Studies on in Vivo Absorption of Iodin by Dog's Thyroid Glands. D. Marine, Cleveland.
91 Nitrogen Excretion of Cat During Purin-Free and Purin-Rich Diet. F. S. Hammett, Boston.

82. **Fat Formation.**—Underhill and Hendrix found that if warm Ringer's solution is perfused through the kidney of the rabbit for a period of twenty-four hours there may be a percentile or an absolute increase in the amount of fat contained in the cortex of the kidney or of the entire organ. These results confirm those of Gross and Vorpahl. Unlike Gross and Vorpahl, who cite these findings as evidence for the formation of fat from protein, the authors believe that the data may be interpreted merely as an expression of the mechanical difficulty of preventing contamination with fat of that portion of material to be analyzed. Doubt is also expressed concerning the influence of the perfusion with Ringer's solution, for a kidney simply suspended in this medium may yield results entirely comparable with those obtained after perfusion.

83. **Nitrogen in Feedingstuffs.**—The data secured by Hart and Bentley show that the "amid" nitrogen of feedingstuffs is largely composed of free amino-acids and peptid linkings. In most cases the nitrogen in these structures constitutes 50 to 70 per cent. of the water-soluble nitrogen. The acid-amid nitrogen is relatively small, seldom exceeding 20 per cent. of the water-soluble nitrogen, and more often being below 10 per cent. Corn stover is an interesting exception, showing approximately 40 per cent. of the water-soluble nitrogen in acid-amid form. The ammonia nitrogen rarely exceeded 5 per cent. of the total water-soluble nitrogen, and in some instances was wholly absent.

84. **Pituitary Feeding and Egg Production.**—Clark's experiments show that feeding of pituitary gland substance (anterior lobe) increased the egg production of hens whose production curve was on the decline. The dosage was effective on the fourth day after the first dose and lasted for several days after the last dose. The hatchability of eggs from dosed parents was increased.

86. **Carbohydrate Metabolism.**—Underhill and Murlin show that the subcutaneous injection of hydrazin into fasting dogs induced an increased rate of carbohydrate combustion as measured by the respiratory quotient. This increased combustion of carbohydrate probably explains the diminished blood sugar content and the disappearance of glycogen from the liver and muscles observed in previous communications. Subcutaneously introduced dextrose is oxidized more rapidly in dogs that have received hydrazin than in the normal fasting animal. Such injections of sugar to hydrazinized dogs also appear to exert a specific dynamic action. Hydrazin exerts no specific influence of heat production.

88. **Blood Sugar Estimation.**—The method worked out by Pearce is as follows: Two c.c. of blood are added to 19 c.c. of water; 10 c.c. of dialyzed iron and 1 c.c. of saturated sodium sulphate solution are now added and the solution is filtered. Two c.c. of the clear filtrate are taken for estimation by the modified Bang method. This is treated with 10 c.c. of saturated solution of potassium chlorid and 1 c.c. of Bang copper solution, in a 25 c.c. Jena flask, on the neck of which a rubber tube is drawn. The flask is placed in an oil bath heated to 140 C. and left there for exactly five minutes. At the end of this period the rubber tube is clamped off with a hemostat. When cool, CO_2 is introduced to fill the vacuum which has been made by the condensation of the steam, and the solution is titrated in an atmosphere of CO_2 with N/100 iodin solution, starch being used as an indicator. A solution made up with pure water in place of sugar solution will give a reduction equal to 0.2 c.c. of iodin. For this reason, 0.2 c.c. is subtracted from all titration results. The value of the iodin in terms of sugar is obtained before each series of titrations by the method above outlined.

90. **Iodin in Thyroid Gland.**—Marine's experiments emphasize the extraordinary affinity of the thyroid tissue for iodin. When one considers that as high as 18.5 per cent. of a given intake of iodin by mouth may be recovered from a thyroid

whose ratio to the body weight is as 1:687, it stands alone at present among the specific affinities of tissues for inorganic substances. The results further emphasize the fact that maximum thyroid effects are induced by minimum amounts of iodin. The amount of a given intake absorbed depends, for the most part, on the size of gland and the existing degree of hyperplasia or the degree of saturation with iodin at the time of its administration.

Journal of Nervous and Mental Disease, Lancaster, Pa.

October, XLII, No. 10, pp. 657-720

92 Exact and Inexact Methods in Neurology and Psychiatry. G. W. Jacoby, New York.
93 *Studies on Localization of Cerebellar Tumors. E. G. Grey, Boston.

93. **Localization of Cerebellar Tumors.**—The purpose of Grey's paper is to discuss the importance of staggering gait, limb ataxia, the Romberg phenomenon, and adiadochokinesis in localizing new growths in the posterior cranial fossa. It is based on an analysis of the records of forty-eight cases of tumor which involved the cerebellum either directly, or indirectly by pressure. The diagnosis and localization of the lesion were confirmed in all of the cases either at operation or on postmortem examination. All records have been excluded which showed that the disease had extended into other parts or which included additional factors likely to confuse the symptom complex. There were nineteen cases in which new growths, gliomata, endotheliomata and tuberculomata occupied one or the other cerebellar hemisphere. On examination all showed some degree of the characteristic tottering or drunken gait. There were nine cases in which the tumors gliomata and tuberculomata occupied a central position in the cerebellum, namely, they involved the vermis and to some extent the neighboring portions of the lateral lobes. In one the gait remained unaffected. Of twelve patients with lesions in one or the other lateral recess, endotheliomata and cysts, one had an apparently normal gait. In the remaining eleven the usual uncertainty was evident. Of three cases of median tumors posterior to the cerebellum, two ependymal gliomata and one angioma, the gait remained unaffected in one.

The Romberg test was used in sixteen patients with unilateral, intracerebellar tumors. Of these, four fell or tended to fall toward the affected side. The swaying or falling was chiefly away from the lesion in five cases. In patients with new growths involving the vermis, three fell, or tended to fall, backward. One was equally unsteady in all directions. The remaining cases, seven in number, swayed more toward one side. Of thirteen patients with cerebellopontine new growths the swaying was directed toward the affected angle in six, and toward the unaffected in two. An unsteadiness equally marked in all directions appeared in three cases. In only one instance was a negative Romberg found. The lesion, an ependymal glioma in one of three cases of median tumors posterior to the cerebellum, rested on the medulla and cord, causing flattening of the latter. The Romberg was negative. The other two cases, an angioma and a second glioma, fell principally in one direction. From the data presented it is evident that in considerably over 50 per cent. of the cases the direction of swaying or falling bore no direct relation to the location of the tumor. Accordingly the author believes that it is fair to conclude that while this test is useful in establishing a diagnosis of subtentorial new growths, a swaying toward one or the other side has no real significance in localizing the tumor.

Limb ataxia was studied in eight patients with tumors involving the vermis. In all, with two exceptions, the amounts of ataxia on the two sides were quite dissimilar. No ataxia was discernible in one case of tumors within one hemisphere. While it was equally marked on either side in five (one had little), in ten it appeared coarser on the homolateral, and in two coarser on the contralateral, side. No ataxia was visible in two cases of tumors in the cerebellopontine angle; in a third it appeared equally marked on the two sides. Of the thirteen members of this group, ten exhibited more incoordination in the limbs of one side. Very little ataxia was evident in median tumors posterior to the cerebellum. In one it was entirely absent; in the remaining two it appeared only in the arms and then to a slight degree. Tumors within one hemisphere: there was normal diadochokinesis in two patients. Adiadochokinesis was present in twelve cases. In three it appeared equally bad on the two sides and in nine more marked on the side containing the new growth. Tumors involving the vermis: two patients exhibited no adiadochokinesis in either limb. In a third it was present, but to an equal extent on the two sides. A unilateral adiadochokinesis was noted in the remaining four cases of the group. In two of these the tumors encroached more on one of the hemispheres than on the other. Tumors in the cerebellopontine angle: of twelve cases with lateral recess tumors four exhibited normal synergic movements. Adiadochokinesis was noted homolateral to the lesion in six.

Journal of Sociologic Medicine, Easton, Pa.

October, XVI, No. 5, pp. 253-348

94 Hospital Organization of Railway Systems. C. W. Hopkins, Chicago.
95 Refrigeration, Transportation and Conservation of Poultry and Fish Products. M. E. Pennington, Philadelphia, and E. D. Clark, Washington, D. C.
96 Infant Mortality and Urban, Housing and Living Conditions. H. H. Hibbs, Jr., New York.

Kansas Medical Society Journal, Topeka

October, XV, No. 10, pp. 299-328

97 Factor of Age in Incidence and Death of Typhoid. W. J. V. Deacon, Topeka.
98 Correlation of Clinical and Serologic Findings in Paresis and Cerebrospinal Syphilis. I. A. Darling, Warren, Pa., and P. B. Newcomb, Osawatomie.
99 Medical Ethics. H. Plumb, Pleasanton.
100 University Health Fee. J. Sundwall, Lawrence.

Lancet-Clinic, Cincinnati

October 16, CXIV, No. 16, pp. 339-365

101 Fractures in Vicinity of Joints. C. E. Caldwell, Cincinnati.
102 Organs of Special Senses in Life Insurance. W. A. Peterson, Chicago.
103 Clinical Study of Stammering. R. Reed, Cincinnati.

October 23, No. 17, pp. 367-386

104 Urinary Calculi. E. O. Smith, Cincinnati.
105 Drug Addictions and Their Treatment. T. D. Crothers, Hartford, Conn.
106 Social Service Handicraft Shop. N. Ryan, Cincinnati.
107 Blindness After Salvarsan Therapy, Optic Atrophy, Atypical Psychosis. C. E. Kiely, Cincinnati.

Medical Record, New York

October 30, LXXXVIII, No. 18, pp. 727-768

108 Habit and Malocclusion. G. V. N. Dearborn, Cambridge, Mass.
109 Comparative Mortality Experience Among Abstainers and Nonabstainers from Alcohol. W. E. Porter, New York.
110 Dementia and Multiple Tuberculous Brain Abscesses. G. B. Hassin, Chicago.
111 Infectious Diseases of Intramural Insane; Their Prevention and Treatment. J. A. Jackson, Philadelphia.
112 Lime Therapy of Diabetes. M. Kahn and M. H. Kahn, New York.
113 Treatment of Opium or Morphin Addiction. S. T. Rucker, Memphis, Tenn.

Military Surgeon, Chicago

October, XXXVII, No. 4, pp. 311-410

114 Lessons of Great War. J. R. Kean, U. S. Army.
115 Auto-Truck Couplings for Escort Wagons. F. W. Hendley, Ohio N. G.

New York Medical Journal

October 30, CII, No. 18, pp. 881-928

116 An Eighteenth Century Quack in French Canada. W. R. Riddell, Toronto, Canada.
117 Pituitary Extract. S. W. Bandler, New York.
118 Case of Filariasis Associated with Schistosomiasis. R. C. Rosenberger, Philadelphia.
119 Hypopituitarism; Report of Two Cases. L. N. Boston, Philadelphia.
120 Status Thymicus Associated Probably with Inferior Thyroid Lobe. H. A. Houghton, Bayside.
121 Effect of Smoking on Circulation. J. Aikman, Rochester.
122 Eye in Diagnosis. W. F. C. Steinbugler, New York.
123 Treatment of Horse Asthma by Repeated Injections of Normal Horse Serum. L. A. Levison, Toledo.
124 Anesthetic Risk in Surgery. T. L. Dagg, Chicago.
125 Infant Drug Addicts. P. M. Lichtenstein, New York.
126 *An Unusual Complication of Acute Appendicitis. M. B. E. Sutton, New York.

126. **Complication of Acute Appendicitis.**—When first called, Sutton found the patient suffering from intermittent colicky abdominal pain; abdomen tympanitic; temperature and pulse

normal. No abdominal tenderness. Gave soapsuds, enema, liquid diet, castor oil, 1 ounce. Diagnosis: Acute intestinal indigestion. At 4 p. m., temperature, 100; pulse, 90, and of good quality; pain, as before; slight localization of pain over McBurney's point. Abdomen slightly tympanitic. Return of enema good, constipated mass. Treatment: Ice bag to right iliac fossa, liquid diet. Diagnosis: Acute appendicitis. Five a. m. next day: patient suffering with sharp shooting pains in vulva, in addition to abdominal pains, still same character as before. Catheterized and obtained 4 ounces clear straw colored urine. Temperature, 102; pulse, 110, weak and compressible; marked tenderness over McBurney's point; slight rigidity of right rectus. On consultation immediate operation advised. On operation, Sutton found at the distal end of the appendix a ruptured abscess, firmly adherent to the posterior wall of the bladder, and a beginning peritonitis. As the vulva and bladder are supplied in part by the sacral plexus, it is easy to understand why such a complicating symptom should arise. The diagnosis was also complicated by the ovarian pain. A bimanual examination was not advisable as the patient was a virgin. Sutton believes the symptom of a sharp shooting pain in the vulva to be diagnostic of an adhesion of the posterior wall of the bladder.

Pennsylvania Medical Journal, Athens

October, XIX, No. 1, pp. 1-64

127 *Civic Responsibility of Physician and Medical Society. J. B. McAlister, Harrisburg.
128 Significance of Bladder Symptoms in Presence of Diseases of Female Pelvic Organs. F. E. Keene, Philadelphia.
129 Pennsylvania's Relation to Industrial Safety and Health. J. P. Jackson, Harrisburg.
130 Programs. H. W. Albertson, Scranton.
131 Live Wire Secretary. S. C. Smith, Hollidaysburg.
132 Secretary-Editor; Two in One. J. B. Carrell, Hatboro.
133 Results of Examination of Cultures from Suspected Cases of Diphtheria and Other Pharyngeal and Nasal Conditions. G. R. Moffitt, Harrisburg.
134 Uveitis. G. B. Jobson, Jr., Franklin.
135 Intrarectal Use of Sodium Salicylate in Uveitis. J. F. Klinedinst, York.
136 Internal Medication in Treatment of Catarrh of Upper Respiratory Tract. G. R. S. Corson, Pottsville.
137 Management of Breast Feeding; Case Reports. C. K. Johnson, Burlington, Vt.
138 Some Common Mistakes in Interpretation of Laboratory Reports. F. H. Harms, Chicago.

127. Abstracted in THE JOURNAL, Oct. 9, 1915, p. 1303.

Southwest Journal of Medicine and Surgery, El Reno, Okla.

September, XXIII, No. 9, pp. 257-284

139 Tuberculosis. T. Y. Hull, San Antonio, Texas.

West Virginia Medical Journal, Wheeling

October, X, No. 4, pp. 109-144

140 Limitations of Local Anesthetics in Anorectal Surgery. S. G. Gant, New York.
141 Diagnosis and Treatment of Chronic Laryngitis. G. A. Aschman, Wheeling.
142 Extraperitoneal Cesarean Section. R. J. Reed, Wheeling.
143 Dislocations of Hip Joint. C. S. Hoffman, Keyser.
144 Inunction Therapy in Infancy and Childhood. E. B. Gerlach, Huntington.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

October 9, II, No. 2858, pp. 525-556

1 Value of Hypochlorous Acid in Treatment of Cases of Gas Gangrene. J. Fraser.
2 Hospital Ship in Mediterranean. H. Chitty.
3 Acute Renal Disease Among Troops in France. R. G. Abercrombie.
4 Importation of Bacillary Dysentery. A. E. Carver.
5 Case of Molluscum Fibrosum. A. W. Gill.
6 Two Cases of Acute Actinomycosis of Parotid Gland. E. D. Telford.

China Medical Journal, Shanghai

September, XXIX, No. 5, pp. 287-366

7 *Splenomegaly; Report of One Hundred and Four Cases Met with in South China. G. D. Whyte.
8 *Splenectomy in Kala-Azar. S. Cochran.
9 Continued Fever of Korea. H. H. Weir.
10 Roentgen-Ray Experiences in Mission Hospital. A. F. Cole.

7. **Splenomegaly.**—Half the cases seen by Whyte occurred between the ages of 16 and 25 years, when the patient became aware of a lump in the position of the spleen. Forty per cent. told of relatives who were suffering from enlarged spleen, etc., but it was noted that this percentage varied with the district from which the patient came, namely, eighteen patients were distributed over three districts and only three of these (17 per cent.) had relatives affected, whereas of thirty-eight patients who came from one single district, in as many as twenty-four cases (63 per cent.) at least one relative was affected. The duration of illness up to the time the patient came to the hospital varied between a few months and (in one case only) thirty years. In 28 per cent. of the cases the illness had lasted for ten or more years. Eighty-eight per cent. of the patients remembered having had attacks of fever, and in two thirds of these cases the form of infection was either simple or double tertian, the remainder being cases of quartan fever. Edema or ascites had been present, or was found when the patients came to the hospital, in 62 per cent. of the cases. Hemorrhage usually from the bowel or the nose was recorded in 61 per cent. of the cases. Diarrhea was recorded in 50 per cent. of the cases. The erythrocytes varied in number from two and a half to four millions per cubic millimeter in more than half the cases. The majority of the remaining cases showed between four and five millions, though a few (11 per cent.) had less than two and a half millions. The color index varied in different cases from 0.6 to 1.3, but in two thirds of the cases it did not exceed 0.9. Nucleated red cells were found in one half the cases whose total red count was less than two and a half million, and in only 6 per cent. of the cases with more than four million cells. In the intermediate group normoblasts were found in 30 per cent. of the cases. Poikilocytes were noted in 27 per cent. of the cases examined. Two thirds of the cases had less than 3,000 white cells. The percentage of polynuclears varied from 40 to 80 per cent.; 89 cases having between 55 and 75 per cent.

8. **Splenectomy in Kala-Azar.**—Following removal of the spleen in three cases Cochran says the patients showed an immediate and marked increase in hemoglobin and the leukopenia was abolished, there being a tendency to a moderate leukocytosis. One patient survived only seventeen days. The other two are now in considerably better health than before the operation. In one of them the liver was shrunk to normal size from a previous marked hypertrophy. Both have added weight. The temperature curve in both is more nearly normal than before the operation. Parasites are still easily found, though in one of the cases the number seems smaller.

Dublin Journal of Medical Science

October, III, No. 526, pp. 241-320

11 Pituitary Extract with Special Reference to Its Action During Pregnancy and Labor on European Women. R. Johnson.
12 Minor Ailments; Their Importance in Warfare. W. F. Evans.

Edinburgh Medical Journal

October, XV, No. 4, pp. 241-304

13 Miliary Aneurysms in Relation to Cerebral Hemorrhage. T. Shennan.
14 Case of Myxedema. J. Miller.
15 Case of Bronchopneumonia, Purulent Otitis Media and Interna and Leptomeningitis; Postmortem; Microscopic Examination of Ear. J. Thomson and J. S. Fraser.
16 Case of Subacute Purulent Otitis Media, Labyrinthitis and Purulent Leptomeningitis Due to Capsulated Streptococcus; Spontaneous Recovery. J. S. Fraser and J. L. Owen.
17 Case of Myxedema, with Tetany and Suprarenal Insufficiency. J. Eason.

Journal of Tropical Medicine and Hygiene, London

October 1, XVIII, No. 19, pp. 217-228

18 Babesia or Piroplasma. A. J. Chalmers and R. G. Archibald.
19 *"Boomerang Leg"; Bone Disease Occurring Among Australian Aboriginals. A. Breinl and H. Priestley.
20 Flagellate Forms of Leishmania Donovani in Tissues of Experimentally Infected Dog. C. M. Wenyon.

19. **"Boomerang Leg."**—This disease has for sometime been known as "boomerang leg," on account of the similarity of the shape of the legs to that of a boomerang. It affects young

natives of both sexes and the resulting deformity persists throughout their life, and in every case seen both legs were affected. The onset seems to be gradual; the children complain at first of pains in the shins, sufficiently severe to prevent them from walking. The skin over the tibia is tender to pressure, but there is no swelling noticeable. These pains become less severe in the course of time, the children begin to use their legs again, and the tibiae and fibulae bend forward gradually and assume the characteristic shape. In consequence of this the center of gravity of the body is displaced forward, the patient becomes flatfooted, and the gait shuffling. The deformed bones gradually increase in thickness, but retain their altered shape. The history of the disease in conjunction with the appearance of the bone suggests that "boomerang leg" is the result of a chronic osteomyelitis of both tibiae. It takes, at first, the form of a rarefying osteitis, corresponding clinically to the early and painful stages of the disease and giving rise to the softening of the bone and the characteristic deformity. This phase is followed later by a condensing osteitis, in cases in which the increased activity of the osteoblasts leads to a progressive thickening of the lamellae, to bony metaplasia of the fibrosed marrow, and to the reduction of the marrow spaces. A simultaneous progressive periosteal new development causes the increase in the thickness of the shaft. The etiology of "boomerang leg" is unknown, but syphilis and tuberculosis can be excluded.

Lancet, London

October 9, II, No. 4806, pp. 795-846

21 Science and War. W. Osler.
22 War and Medical Education of Women. F. E. Willey.
23 *Spasmodic Symptoms in Rheumatism. F. J. Poynton.
24 Amputation by Plane Circular Section. G. A. Wright.
25 *Radical Treatment of Septic Compound Fractures. V. Pennell.
26 *Intestinal Drainage in Septic Peritonitis. A. J. Nyulasy.
27 Significance of Pulsus Alternans and Some Other Forms of Uneven Pulse. A. E. Carver.
28 Case of Complete Branchial Fistula in Adult. C. H. Whiteford.

October 16, No. 4807, pp. 847-900

29 Ethics and Law of Drug and Alcohol Addiction. W. J. Collins.
30 *Clinical Characteristics of Cases Treated as Paratyphoid. H. Robinson.
31 Explanation of Recto-Urethral Anomaly and Some Points in Normal Anatomy. F. W. Jones.
32 Etiology and Prevention of Cerebrospinal Fever. H. Sutherland.
33 Cases of Transient Aphasia, Hemiplegia and Hemiparesis Due to Arterial Spasm. J. G. Sharp.
34 Labor Complicated by Eclampsia and Glucosuria; Cesarean Section; Recovery. C. P. White.
35 Roentgen-Ray Treatment of Fungating Epithelioma with Introduction of Progressive Filtration. C. Kempster.
36 Case of Empyema Following Poisoned Arrow Wound; Natural Cure by Absorption. J. F. Corson.
37 Case of Twin Ectopic Pregnancy. G. W. Johnson.
38 Employment of Bandages for Irrigation of Wound Surfaces with Therapeutic Solutions and Draining of Wounds. A. E. Wright.

23. **Spasmodic Symptoms in Rheumatism.**—Among the symptoms discussed by Poynton under this head are migraine, muscular spasm, paroxysmal sensory symptoms and anginal attacks. He points out that a damaged heart is made worse by an acute rheumatic attack; then the development of attacks of cardiac pain, becoming at times frequent; steady increase in the predominance of symptoms of a functional or hysterical character; remarkable intervals of freedom; and a final abrupt termination of the illness, as was well illustrated in a case cited by Poynton. The necropsy showed a large heart (27 ounces); the pericardium was generally adherent. There was myocardial fibrosis with endocardial thickening of the membrana septi, and old-standing thickening of the aortic and mitral valves. The aorta, the openings of the coronary vessels, and the coronary vessels themselves were not apparently diseased. An electrocardiogram taken at a time when the attacks were frequent only demonstrated that there was hypertrophy of the left ventricle. Irregularities of rhythm were conspicuous by their absence throughout.

25. **Treatment of Septic Compound Fractures.**—The method of treatment adopted by Pennell is to make a large incision over the site of the fracture, define the ends of bone, remove any small detached portions of bone and shrapnel, and after placing the two or more main fragments in position, either fix them with a Lane's plate, suture them with silkworm gut, or, in cases in which there is much loss of bone, transpose a graft from the tibia or fibula. If the condition is fairly clean Pennell sews up the muscle and fasciae, leaving only a small rubber drain down to the plate. If it is septic he makes no attempt to "bury" the plate or fixing apparatus. Active antiseptic treatment is instituted.

26. **Intestinal Drainage in Septic Peritonitis.**—The rational treatment of this toxemia in Nyulasy's opinion is the removal of unabsorbed intestinal toxin and the prevention of its further production. Both these ends may be secured by intestinal drainage, provided the peritoneal cavity is not charged with excessive poison and that the focal factor is eliminated. The following is a summary of Nyulasy's treatment: If the focal factor has been eliminated, free toxic fluid mopped away, septic necrotic areas drained, the Fowler position employed, saline freely administered, and early purgation given a trial, but the patient nevertheless continues to deteriorate from toxemia due to paralytic ileus, then intestinal drainage should be instituted. If, at the primary operation, drainage of the septic focus in the abdomen has not been employed and the patient deteriorates, a drainage tube may now be introduced; if the patient does not then rapidly improve, but continues to go down hill, intestinal drainage may now be instituted under local anesthesia. If, when the patient is first seen, the evidence of toxemia from paralytic ileus is positive, and especially if lividity is obvious, then intestinal drainage should form part of the primary operation.

30. **Cases Treated as Paratyphoid.**—Paratyphoid (A and B) in the British expeditionary force, according to Robinson's observation, is a disease much shorter and milder than typhoid, as met with in civilian practice and in the South African campaign. Its onset may be gradual or moderately sudden. Headache and abdominal pain are the most constant symptoms. Shiverings at the onset; cough, pains in the limbs and back, diarrhea, constipation, nosebleeding are the next commonest symptoms; all these are met with in about 30 to 60 per cent. of cases. Vomiting at onset and sore throat later are by no means rare. Definite rose spots in successive crops are found in about 60 per cent. of cases. The abdominal reflex is absent in rather under 50 per cent. The pulse rate is extraordinarily slow, even more so than in typhoid. Relapses of brief duration are not uncommon. Several complications occur more rarely and are the counterparts of those associated with typhoid. The paratyphoid bacillus (A or B) is frequently isolable from the feces, but in many cases not until after the symptoms have subsided; one negative finding should not be accepted as conclusive. It is also occasionally isolable from the blood, urine and from metastatic abscesses. Distinct help in diagnosis is obtainable from repeated quantitative Widal reactions, but much experience is required for their interpretation, and they must be read in conjunction with the clinical evidence and with the history of previous inoculation. On the assumption that this disease is of the enteric group, the same precautions as in the case of true typhoid are indicated against its spread. In particular, carriers must be watched, for bacilli may be present in their urine and feces after all symptoms of illness have subsided.

Bulletin de l'Académie de Médecine, Paris

September 28, LXXIV, No. 39, pp. 325-339

39 Suture of the Bone after Gunshot and Shell Wounds. (La suture osseuse dans les suites de plaies de guerre.) C. Dujarier.
40 *Efficacy of Magnesium Chlorid in Dressing Wound. (Étude des effets therapeutiques du chlorure de magnésium.) Rosenblith.
41 Vaccination against Typhoid Reduces Mortality by Two-Thirds at Least. L. Bernard.

40. **Magnesium Chlorid in Therapeutics.**—Rosenblith relates clinical experiences which have led him to the same conclusions as to the efficacy of magnesium chlorid that Delbet has reached by experimental research. Rosenblith gave it by subcutaneous injection in April, 1913, to relieve a very painful case of deforming rheumatism, and the results were extremely encouraging. In the last few months he has been using it

in dressing wounds, and with most excellent results. It seems to increase the opsonic index and generate substances antagonistic to proliferation of bacteria.

Lyon Médical, Lyons

CXXIV, No. 1, pp. 1-36

42 *Giant Magnet for Localizing and Extracting Metal Foreign Bodies in the Tissues. (Emploi de l'électro-aimant géant dans la recherche et l'extraction des corps étrangers magnétiques.) L. Léorat.

No. 2, pp. 37-72

43 Conditions Favoring Restoration of Function in Severed Nerve. J. P. Morat.

No. 3, pp. 73-108

44 Roentgen Localization of Foreign Bodies. Lagoutte.
45 *The Mineral Mud and Brine Baths at the Health Resorts on the Black Sea. (Les limans de la mer noire.) E. Barral. Commenced in preceding volume.
46 *Blister Cupping. (Ventouses vésicantes.) P. Aubert.

No. 4, pp. 109-144

47 Early Diagnosis of Cerebrospinal Meningitis. E. Weill.
48 Glossolaryngeal Scapulopharyngeal Hemiplegia from Shrapnel Bullet. (Nouveau syndrome paralytique pharyngo-laryngé par blessure de guerre.) Collet.

42. **Magnet for Extraction of Foreign Bodies.**—Léorat relates that the first known use of the magnet for extraction of a scrap of metal in the tissues dates from two thousand years before Christ, as recorded in one of the Vedas, the book of the Brahmins. The eye infirmary at Lyons has been fitted up as a base hospital, and the giant magnet, designed to extract scraps of metal from the eyes, has been found very useful in locating and extracting scraps of shells and bullets in the seat, thigh, neck and back, as well as in the eyes. One man had been showered with small scraps from an exploding shell, and many of them buried deep in the tissues were drawn out by the magnet alone. At one point five scraps were thus extracted through the single hole through which they had entered. In two other cases a piece of a needle or pin was thus drawn out. He gives some illustrations which show how the size, shape and depth of the foreign body can be approximately estimated from the shape of the protuberance that forms above it when the magnet is applied to the region. The more of a peak, naturally, the nearer to the surface. The base of the protuberance should be outlined; it is circular if the needle, for example, stands perpendicular; it is an ellipse if the needle lies parallel to the skin, and it is egg-shaped if the needle lies slanting. Bird shot is often made of iron, and hence is magnetic, and nickel-coated bullets also respond to the magnet. He suggests the possibility of making a magnet long and thin that might be introduced into the esophagus, stomach or air passages, and thus draw out metal foreign bodies.

45. **Mud and Brine Baths.**—This long study of the "limans" of the Black Sea concludes with Borisoff's warning that acute diseases should never be given treatment with mineral mud or brine baths as they are exclusively for chronic affections. In his experience with over 10,000 patients taking the baths, he found that the chronic affection always showed a phase of aggravation under the influence of the baths. That is to say, the chronic affection developed an acute phase, and the defensive forces then rallied better and often conquered the trouble without further ado. The technic, therefore, of the mud and brine baths health resorts in question aims to transform a chronic into an acute affection. The strength of the patient must be sustained, all depressing factors avoided, and constant medical supervision is imperative, especially when the nervous or cardiovascular system is impaired. Two diabetics taking the mud baths without medical advice developed fatal coma.

46. **Blister Cupping.**—Aubert expatiates on the benefit from revulsion in pulmonary edema, and relates that he has thus tided an elderly physician of 75 through repeated attacks of pulmonary edema during the last three years. The drawbacks of cantharidin blisters are avoided by using an ordinary tumbler, with a lighted, crushed up piece of newspaper inside, applied to the skin in the dorsolumbar region. The tumbler is pressed firmly into the skin and left there for an hour and a half or two hours. Multiple blisters form under it, and they continue to secrete for about a week. He has had no opportunity to apply the measure in affections other than pulmonary edema, but it works so well in this that he would not hesitate to use it for congestion of the lungs or viscera, and attacks of pain in the kidney, along the sciatic nerve or elsewhere. The cupping glass does not get so good a hold on the abdomen as on the back; the secret of success is a good hold and an hour and a half to two hours' application. He has his patients with pulmonary edema sit up in a comfortable arm chair, with several shawls thrown over the legs and trunk, or a wide dressing gown that can be readily drawn out of the way, to permit this cupping blister revulsion.

Paris Médical

V, No. 1, pp. 1-16

49 *Partial Tetanus. V. Courtellemont.
50 Technic for Massage after Wounds in War. H. Somen. Concluded in No. 5.
51 *Exercise and Massage in Treatment of Dermatitis Persisting after Wounds in War. F. Debat.

Nos. 2-3, pp. 17-76. Ambulance and Field Hospital Number

52 *Collection and Care of the Wounded on the Firing Line. C. Dopter and Others.

No. 4, pp. 77-92

53 Organic Paraplegia from Shell Explosion without External Wound; Five Cases. J. Heitz.
54 Localization of Projectiles in the Tissues. A. Weil.

No. 5, pp. 93-108

55 Epidemic Tetragenemia; Thirty-Five Cases. F. Trémolières and P. Loew.

49. **Partial Tetanus.**—Courtellemont's patient was a man of 65 who developed attenuated partial and chronic tetanic contracture of the leg after he had stepped on the tooth of a rake and inflicted a slight wound. The first symptoms were observed about fifteen days after the accident, and except for a slight and transient tendency to trismus the disturbances were apparently merely a spastic monoplegia. A painful cramp sometimes developed in the leg and foot affected when he tried to move them. Under epidural injections of antitetanus serum and chloral the symptoms gradually subsided to a complete cure by the end of the sixth week. In connection with this case Courtellemont discusses the literature on partial and atypical tetanus, emphasizing that however unusual the combination or sequence of symptoms, the underlying tetanus is the same disease in all and requires the same treatment.

51. **Massage and Exercise in Treatment of Skin Affections Persisting After Wounds.**—Debat relates that in many cases the dermatitis was the result of corrosion from the antiseptics used in dressing the wounds or of maceration from a moist dressing with boiled water. The tissues become so torpid that they show no inclination to heal. The injury of nerves and vessels in the region may cooperate in the delay in the healing of the dermatitis as also the immobilization of the part. Both of these factors are combated by intermittently stimulating the skin with a 9 per thousand salt solution and exposing the region to the air, as soon as possible having the muscles massaged and exercised. He reports some typical cases showing the rapid healing under such measures of dermatitis long resisting ordinary treatment.

52. **Ambulance and Hospital Number.**—This large number is profusely illustrated and describes and shows the ambulances at work, the hospitals and dressing stations, base hospitals, etc., the sanitary trains, the stretchers in use and the dogs trained to seek for the wounded. The last two of the twelve articles by various writers are descriptions by Camus of the physiotherapeutic institutes at Paris and by Claude of the regional neurologic centers which have been established at various points. Claude states that specialist care and hospital treatment for the neurologic cases has been organized at several points in Paris, and at Lyons, Bourges, Bordeaux, Toulouse, Nancy, Rennes, Marseilles, Nantes and Tours. Other regional neurologic hospitals are to be installed as needed, the results having abundantly proved their usefulness.

Archiv für Kinderheilkunde, Stuttgart

LXIV, Nos. 5-6, pp. 321-472. Last indexed June 5, p. 1948

56 The Bacillus of Whooping-Cough. (Keuchhustenbacillus—Bordet-Gengouschen Bacillus.) I. Jacobsen and A. H. Meyer (Copenhagen).
57 Influence of Summer Vacation on Mortality from Diphtheria and Scarlet Fever. L. Bernhard.
58 Paralysis with Whooping-Cough; Four Cases. (Lähmung bei Keuchhusten.) S. T. Sörensen (Copenhagen).

Deutsches Archiv für klinische Medizin, Leipzig

June 22, CXVII, Nos. 4-5, pp. 361-496. Last indexed Sept. 18, p. 1062

59 Localization by Electrocardiography of Source of Impulse for Heart Action. (Ortsbestimmung der Erregung im menschlichen Herzen mit Hilfe der Elektrokardiographie.) G. Fahr and A. Weber.
60 Variations in Functioning of Respiration Center, especially during Sleep. (Alveolargasanalysen. I.) H. Straub.
61 *Changes in Regulation of Respiration under Psychic and Pharmacologic Influences. (Alveolargasanalysen. II.) K. Beckmann.
62 *Eosinophil Myocarditis. (Untersuchungen über die Herzmuskulatur bei Infectionskrankheiten. I.) E. Liebmann.
63 Sparing of Nitrogen in Man under Intake of Ammonia Salts and Urea. (Stickstoffersparnis durch Darreichung von Ammoniaksalze und Harnstoff.) E. Grafe.
64 The Leukocytes after Vaccination against Typhoid. H. Stieve.
65 Galvanic Excitability of Dying Muscles. (Beitrag zu den Theorien der elektrischen Entartungreaktion.) E. Reiss.

July 20, No. 6, pp. 497-618

66 Daily Fluctuations in the Carbon Dioxid Tension of the Alveolar Air and Their Causes. (Alveolargasanalysen. III.) H. Erdt.
67 Gaseous Interchanges in Human Muscle in Action. (Alveolargasanalysen. IV.) M. Mettenleiter.
68 Determination of Pepsin and Trypsin in Fasting Stomach. G. Dorner.
69 *Dangers of Iodin Medication. A. Oswald (Zurich).
70 Study of the Reaction of Degeneration. (Ueber die Nutzzeit degenerierender Muskeln: Zur Erklärung der Entartungsreaktion.) W. Achelis and M. Gildemeister.
71 *Chilling Causes Coagulation of Fibrin in the Blood Stream. (Das Wesen der Erkaltung.) Aufrecht.

61. **Influence of Emotions and Drugs on the Carbon Dioxid Tension of the Alveolar Air.**—Beckmann found that emotional factors had a depressing influence. This must entail a drop in the concentration of hydrogen ions throughout the entire body. This in turn must affect the functioning of numerous organs. Certain drugs are able to influence the tension, morphin increasing and cola reducing it.

62. **Eosinophil Myocarditis.**—Liebmann found accumulations of eosinophil elements in the myocardium at necropsy of a girl of 12 who had succumbed to diphtheria. The findings in the heart muscle were like those Stäubli and Hübner have reported from cases of trichinosis. Tanaka in 1912 reported eosinophils as a constant finding in four out of fifteen diphtheria hearts, but never in such profusion as in the case here described, with a colored plate. In this case the eosinophils were grouped also in such a way as to suggest that the affection represents a new and rare type of diphtheritic myocarditis. Destruction of muscle tissue cannot be the only factor involved. Liebmann is making a special study of the heart in infectious diseases, and this first communication is to be followed by others.

69. Practically the same article was summarized in these columns, November 6, p. 1682.

71. **Mechanism of Injury from Getting Chilled.**—Aufrecht presents an imposing array of testimony culled from old and modern writers to reaffirm the important part played by getting chilled in the genesis of various diseases and morbid processes. He then reports various experiments on rabbits, all of which confirms his assumption that the chilling causes coagulation of fibrin in the blood stream in the part chilled. The cause of the coagulation is the injury done to the white corpuscles by the cold. The coagulation obstructs the flow through the peripheral vessels involved and the blood is liable to back up into the liver, kidneys and gastric mucosa. The most striking changes were found in the lungs, the coagulation of fibrin entailing microscopic hemorrhage into the interstitial tissue. This occurred in a pronounced form when the hind part of the rabbit was thrice dipped into ice water for ten minutes. The blood chilled in this way passes in the directest way to the arterial circulation in the lungs. The obstruction of vessels by the coagulated fibrin after chilling may be transitory and harmless, but, on the other hand, it may provide a culture medium for germs and explain pneumonia developing after exposure to cold. The hyperemia in the internal organs may also cooperate in the disturbances following chilling.

Deutsche medizinische Wochenschrift, Berlin

September 30, XLI, No. 40, pp. 1177-1204

72 The Spleen in Diagnosis of Typhoid. (Impf-Milzschwellung und Typhusdiagnose.) Goldscheider.
73 *Dysentery. (Ueber Ruhr und ihre Behandlung im Felde.) C. Hirsch.
74 Pseudodysentery. (Y-Ruhr.) E. Fränkel.
75 Bacteriologic Diagnosis of Cholera. W. Schürmann and T. Fellmer.
76 *Abortive Forms of Cerebrospinal Meningitis. H. Hochhaus.
77 Further Favorable Reports on Radiotherapy of Cancer. (Zur Verhütung von Nebenschädigungen bei der Behandlung tiefliegender und tiefgreifender Karzinome mit Radium und Mesothorium.) B. Krönig.
78 Gas Phlegmons of Varied Bacteriologic Origin. H. Selter.
79 Wounds of the Eyes. (Bemerkenswerte Fälle von Verwundung des Sehorgans.) Oloff. Commenced in No. 38.
80 Rapid Healing of Wounds Left Exposed to the Air. (Ueber offene Wundbehandlung.) H. Weissenberg.
81 The Blood Count and Differential Staining in Counting Chamber. (Zur Blutkörperchenzählung und zur Differentialkammerfärbung.) G. C. van Walsem.

73. **Treatment of Dysentery.**—Hirsch reviews the general principles for prevention and treatment of dysentery, and emphasizes that there are not only severe infection and intoxication but serious lesions in the lining of the bowel, and the patient is suffering likewise from lack of water, lack of nourishment, and from the constant draining away of salts. All of these should be regarded in treatment. He advocates one or two tablespoonfuls of castor oil daily at first, supplemented after a few days with repeated small doses of calomel. He has found rectal injections of kaolin or of animal charcoal (one heaping tablespoonful to a liter of warm salt solution) effectual in reducing tenesmus. He generally makes the injection at night and then gives a little opium to ensure a few hours' rest. He does not approve of either kaolin or charcoal by the mouth; they adsorb the digestive ferments and ruin the appetite. Saline infusion combats the loss both of water and of salt.

76. **Abortive Forms of Meningitis.**—Hochhaus remarks that the abortive forms seldom come to the notice of physicians, and yet they are of great epidemiologic importance as sources of infection of others. During the first six months of this year there were thirty-two cases of meningitis at Cologne and twenty-four of these passed under his observation. In all there were pains at the back of the neck, headache, vomiting, stiff neck and a chill; in a few cases the nose and throat secretions gave positive bacteriologic findings. There were also sore throat and bronchitis in most cases. These symptoms all rapidly retrogressed in the sixteen abortive cases and the men felt quite well. The diagnosis was based mainly on the fact that the men had been living with those who had developed severe epidemic meningitis. It is wise when the latter is prevalent to have the nasopharyngeal secretions examined from all those who present any symptoms on the part of the air passages and pains in the limbs.

Deutsche Zeitschrift für Chirurgie, Leipzig

July, CXXXIII, Nos. 5-6, pp. 425-632

82 Wounds of the Lungs. J. Volkmann.
83 Pathology of Surgical Disease of the Vessels. (Zur Pathologie chirurgisch wichtiger Gefasserkrankungen und der Aneurysmen peripherer Arterien.) H. Schum.
84 Experiences at Base Hospital in Balkan War, 1913. (Etappenspitalerfahrungen in Dimotika.) A. Alder.
85 *Nerve Blocking by Kulenkampff's Technic for the Brachial Plexus. E. Schepelmann.
86 Injury of the Crucial Ligaments. (Zur Kreuzbänderverletzung.) R. Morian.
87 Dressing and Immobilizing Wounds. H. Brun.
88 Open Treatment of Wounds. (Offene Wundbehandlung.) Schede.

85. **Blocking the Brachial Plexus.**—Schepelmann states that in his application of Kulenkampff's technic in 300 cases he observed unpleasant by-effects in seven cases, that is, in 2.3 per cent. This included four cases of interference with the breathing on account of injury of the pleura, one case of pneumothorax, and two of brain symptoms, alarming at

first but rapidly subsiding completely. He never witnessed any harm from repeating the plexus anesthesia at weekly intervals, as he had occasion to do in mobilizing some stiff joints. With improved technic and patient waiting, the anesthesia is satisfactory with extremely rare exceptions. He warns, however, that the plexus should never be blocked on both sides. The above statistics do not include nineteen cases presenting what he calls "Horner's syndrome," which he remarks is entirely harmless. They do not include either a case of paresis of the fingers from the constricting band.

Jahrbuch für Kinderheilkunde, Berlin

October, LXXXII, No. 4, pp. 261-346

89 Albumin Milk and Its Substitutes. (Eiweissmilch und ihre Ersatzpräparate.) E. Glanzmann.
90 *Transmissibility of Exfoliating Dermatitis of the Newly Born. M. K. Wolf.
91 *Bacterial Affections of the Urinary Organs in Infants. (Sog. Pyelocystitis im Säuglingsalter.) H. L. Kowitz.
92 *Invagination of the Intestines in Infants and Small Children. (Darminvaginationen im Kindesalter.) H. Wollin (Prague).

90. **Transmissibility of Exfoliating Dermatitis of the Newly Born.**—Wolf encountered within two weeks recently three cases of exfoliative dermatitis in newly born infants, fatal by the ninth to the seventeenth day. The clinical picture was the same in all, and each had been breast fed. Rittershain had 297 cases of the kind at Prague in ten years' experience. He and others regard it as an affection developing only in early infancy, noncontagious, and to be sharply distinguished from pemphigus of the new-born. Others regard pemphigus of the newly born and exfoliating dermatitis of the newly born as the same process, differing merely in its intensity. Wolf has been unable to find in the literature any history of direct transmission from skin to skin but has met with a case of this kind in practice. The mother of one of the three infants mentioned above developed an apparently identical process in the right breast at the point where the child had lain to nurse. The clinical picture was unmistakably the same, after an incubation period of ten days. The general health was not impaired, and under eight days' hospital treatment the condition improved to a practical cure and the woman has not been seen since. A peculiarity of the case was the presence of two hard tumors in the depths of the affected region. One was as large as a hen's egg, the other not so large. They retrogressed without softening, but the local painfulness prevented investigation. They suggest, however, that certain special factors are involved in the production of the exfoliating dermatitis.

91. **Bacterial Affections of the Urinary Organs in Infants.**—Kowitz has examined forty infants under 2 with some affection of this kind. There were about as many boy as girl babies in the series, and the connection with gastro-intestinal disturbances and the bacteriologic findings indicated that bacilli of the colon group, brought by the blood, were responsible for the processes in the various cases. He says that the terms cystitis or pyelitis are not applicable. A more accurate descriptive term would be bacterial nephritis or colinephritis in small children. In 37 of his 40 cases bacteria were found in pure cultures; mixed infection in only 3. Among the pure cultures, colon bacilli were found alone in 24 cases, paracolon bacilli in 10, and staphylococci alone in 3. In these latter cases the infants had furunculosis or eczema. In the 3 cases of mixed infection colon bacilli were present. In the entire 40 cases members of the colon family were found in 92.5 per cent.; this proved conclusively, he thinks, that the germs came originally from the bowel. It is astonishing, he remarks, that so little attention has been paid to the blood in studying disease of the urinary apparatus in small children, especially in "pyelitis in infants." Bahr found bacilli in the blood in 117 of 120 cases of digestive disturbances in infants, in 65 during life, and the colon bacillus predominated far above all others. The blood count in the few cases in which he could make it suggests the importance of research in this line.

In 5 cases Kowitz could trace the development of the urinary affection. First there was albumin in the urine and bacteria soon appeared also in the urine. Then after an interval of five or six days, pus and epithelial cells, and sometimes tube-casts and red blood corpuscles were also found in the urine. With ascending infection the sequence would have been reversed. The cases are grouped and tabulated under various headings, the tables filling six pages. The blood count in twelve cases showed leukocytosis from 10,000 to 20,000 in all but 4; the small lymphocytes ranged from 20 to 72.7, the large from 0.7 to 8; the polynuclears from 15 to 53.7; the eosinophils from 0 to 6, and the mononuclears from 0.3 to 11. The corresponding standard figures for infants are (Japha) 12,000; 25 to 35; 50 to 55; eosinophils 2 to 7 and mononuclears 8 to 15. Pfaundler's figures for infants are: lymphocytes, 22; polynuclears, 51; eosinophils, 4; and mononuclears, 12.

92. **Invagination of the Intestines in Children.**—Wollin analyzes twenty cases from the Prague children's clinic, saying that the outcome confirms the gravity of the prognosis the younger the child. Only three of the thirteen infants less than 1 year old survived, while the seven older than this all recovered. The younger the child, the more difficult the diagnosis, as a rule, and the longer the delay before the operation.

Medizinische Klinik, Berlin

September 26, XI, No. 39, pp. 1065-1092

93 Psoriasis and Allied Diseases. J. Jadassohn. Concluded in No. 40.
94 *Abnormal Mammary Secretion. (Zur Pathologie der Brustdrüsensekretion.) E. Ebeler.
95 Serotherapy of Typhoid. B. Fellner.
96 *Relapsing Fever. (Rückfallfieber.) L. R. v. Korczynski. Commenced in No. 38.
97 Influence of the War on Domestic Animals and Game in the War Zone. (Einfluss des Krieges auf die Tierwelt.) A. Sokolowsky.
98 Prognosis in Typhoid from Bacteriologic Findings. O. Landsberger.
99 Sterilization of Clothing. (Bekämpfung der Kleiderlause durch trockne Hitze.) A. Hartmann.

94. **Pathology of Mammary Secretion.**—Ebeler had his attention called to this subject in 1912 by the case of a woman of 50 from whose breasts there oozed a watery fluid after a laparotomy for myomatous uterus and ovarian cysts. Since then he has examined for mammary secretion in various gynecologic affections, and reports here positive findings in 87 cases. The secretion ranged from a watery fluid to actual milk in the different cases and sometimes in the same case at different times. Genital tumors seem to have a particularly stimulating action on the secreting glands in the breast. He lists 12 positive cases with uterine myoma, 5 with ovarian cysts, 6 with pyosalpinx, 10 with cancer of the uterus, and 11 with retroflexion, 9 with prolapse of genital organs or bladder, 12 with inflammatory processes in the uterus, and 22 with other affections, such as hernia, mammary cancer, tuberculous peritonitis, etc. These different series included women who had never been pregnant, but all were over 20, except one girl of 16 with appendicitis, one of 17 with probable renal tuberculosis, and one of 19 with movable retroflexion of the uterus. In 24.13 per cent. of his 87 cases the women had never been pregnant; a number were virgins and 11 were past the menopause. One was a woman of 82 with prolapse of the vagina. The proportion of cases of colostrum secretion outside of a pregnancy is largest with genital tumors. Klein reported this year the case of a woman of 51, in the menopause for a year, with profuse secretion of milk in both breasts accompanying a sarcoma of the uterus. When the breasts are examined more systematically in the nonpregnant, such cases will be found more common than is recognized at present. A mammary secretion of colostrum therefore cannot be regarded as of so much importance in the diagnosis of pregnancy as has hitherto been accepted.

96. **Relapsing Fever.**—Korczynski has had considerable experience with relapsing fever recently in the eastern seat of war, and states that there was but one attack in 76 per cent. of seventy-five cases, while the other patients had one relapse. He says that salvarsan must be regarded as the sovereign remedy, but it must be given in large doses, 0.9 gm. for adults and from 0.45 to 0.6 gm. for youths. Heart tonics generally are needed. If such large doses of salvarsan seem contraindicated, smaller, repeated doses might be tried.

Monatsschrift für Kinderheilkunde, Berlin

XIII, No. 9, pp. 393-430

100 Local Diphtheria Bacillus-Broth-Culture Reaction in Man. G. Bessau and J. Schwenke.
101 Experimental Research on the Causes of Softening and Destruction of the Cornea: Keratomalacia. E. Freise, M. Goldschmidt and A. Frank.

Münchener medizinische Wochenschrift, Munich

September 28, LXII, No. 39, pp. 1309-1344

102 Degenerated Forms of Gonococci. P. Asch and Adler.
103 *The Blood Count and Agglutination after Inoculation against Typhoid. (Beobachtungen bei Typhusschutzgeimpften.) P. Ziersch.
104 Treatment of Typhoid with Vaccines. (Zur Frage der sogen. Vakzine oder Bakteriotherapie: Ergotrope Therapie des Typhus abdominalis.) F. v. Groer.
105 *Detection of Syphilis in the Public. (Bedeutung der Vorgeschichte, des Befundes und der Wassermannschen Reaktion für die Erkennung der syphilitischen Ansteckung in den breiteren Volksschichten.) G. Hubert.
106 *Relations of Life to Light. (Beziehungen des Lebens zum Licht.) F. Schanz.
107 *Serodiagnosis in Psychiatry. (Zur Frage der Bedeutung des Dialysierverfahrens nach Abderhalden für die Psychiatrie.) V. Kafka.
108 Wounds of Joints. (Gelenkverletzungen, Gelenkeiterungen und ihre Behandlung.) E. Payr. Commenced in No. 37.
109 Abdominal Wounds. (Bauchschussverletzungen.) P. Kraske.
110 Pneumococci and Staphylococci Not Conveyed by Lice. (Zur Frage der Uebertragung von Bakterien durch Läuse.) E. Widmann.
111 *Dangers from Oxygen in Treatment of Gas Phlegmons. (Vorsicht bei der Sauerstoffbehandlung der Gasphlegmonen!) E. Borchers.
112 *Reliability of Preventive Serotherapy of Tetanus. (Zur Frage der prophylaktischen Impfung gegen Tetanus.) W. Wolf.
113 Abdominal Wounds. (Zur Pathologie und operativen Behandlung der Bauchschussverletzungen.) A. Läwen.
114 Abdominal Wounds. M. Matyas.

103. **Blood Findings After Inoculation Against Typhoid.**—Ziersch examined daily the blood of forty-five soldiers who had been inoculated three times. No regularity in the response to the agglutination test could be detected during the following months. A positive response was obtained in eighteen, and a negative in twenty-seven. The leukocyte count ranged about 4,900 to 5,700. The differential blood count kept like that of typhoid except that the eosinophils did not disappear as with typhoid.

105. **Differential Diagnosis of Syphilis.**—Hubert relates that during the last three years every patient at the first medical clinic at Munich has been examined for possible syphilis. The previous history in each case, the physical findings, and the response to the Wassermann test were correlated, the results demonstrating that 8.8 per cent. of the 8,652 patients applying to the clinic were infected, although fully 52 per cent. of the 405 men and 75 per cent. of the 354 women infected were unaware of it. This lack of any previous history or suspicion of syphilis may prove misleading in treatment of cardiovascular affections, apoplexy or headache. Hubert was also impressed with the prevalence of latent syphilis, and the importance of serodiagnosis for revealing unsuspected syphilis in such a large proportion of the general public. He found also that quite a large proportion of the patients denied syphilis, in deliberate falsehood. In the cases of tabes, the Wassermann reaction alone cleared up the diagnosis in 56 per cent. of the men and in 65 per cent. of the women. The anamnesis supplemented the Wassermann only in 75 per cent. in the male tabetics and in 68 per cent. of the women. The experiences related confirm the value of the routine Wassermann test in general hospital practice.

106. **Relation of Life to Light.**—Schanz cites recent authorities to sustain the results of his own research which has demonstrated that insects and the dwellers in the sea are all color blind. They see everything gray in gray. As Hess has established, only vertebrates living in air are able to distinguish colors. This demolishes the old conception that the colors of the flowers serve to attract and guide insects. The brilliant coloring of the sea dwellers is obscured to the eye of man at a depth of a few feet, and the light penetrating the water changes its color as it descends lower and lower; the red and yellow rays being absorbed more than the blue or green. The sea dwellers look red and yellow to us because their integument is so constituted that they are able to absorb the rays which are able to penetrate to them, and thus they can utilize the light which reaches them. The coloring matters in their integument thus serve as photocatalyzers, the same as the hematoporphyrin in the back of the earthworm. He explains further that light modifies albumin, changing it from a readily soluble into a much less soluble form. There are many substances which retard or hasten this change. The most common substance of the kind is chlorophyl, with whose photocatalyzing properties we are all familiar. In certain animals the entire integument is sensitive to the action of light, thus forming an apparatus for the perception of light as it is provided with some photocatalyzing element. This seems to be the case with the sea dwellers: In others, like the earthworm, this element is restricted to some part of the creature. In the higher animals this localization is still more specialized, and the eye develops. There is much to sustain the assumption, he adds, that the act of seeing in the higher animals is at bottom the same photocatalytic process which we observe going on everywhere throughout all living beings.

107. **Serodiagnosis and Psychiatry.**—Kafka concludes his discussion of this subject with the remark that the ninhydrin reaction must be studied further, tranquilly and objectively, as the results already obtained show promise of great usefulness. To date, however, the method has no actually practical value in psychiatry. He urges simultaneous study of other methods working toward the same aims, to control and supplement the findings with the dialysis method, mentioning P. Hirsch's "interferometry" in particular for this purpose. Even with all these restrictions, however, the Abderhalden technic may already yield important information to fill gaps in our knowledge of the case, especially in differentiating between dementia praecox and uncomplicated cases of manic depressive insanity or psychoneuroses; also between epilepsy and hysteria, between paralysis and cerebral syphilis, between organic affections of the central nervous system and neuroses. The cases of glandular imbecility and idiocy will be recognized better. Chief in interest, however, is the light thrown on the pathogenesis of nervous and mental affections.

111. **Dangers of Oxygen in Treatment of Gas Phlegmons, Etc.**—Borchers injected a 3 per cent. hydrogen dioxid solution subcutaneously and intramuscularly in a case of extensive gas phlegmon after exarticulation of the shoulder. The prompt recovery he ascribed to the nascent oxygen, and was confirmed in this view by the prompt recovery in two other similar cases. In the fourth case, however, breathing stopped at once on injection of the dioxid solution into the stump of the arm after amputation. This makes the fifth case on record of sudden death from this cause, and it warns of the dangers of injecting oxygen into the tissues. He presents evidence further that the prognosis of gas phlegmons is not so grave as has been hitherto assumed. Under simple multiple small incisions the infected lymph stream is diverted outward, and the infection is conquered. Of course these remarks as to the danger of oxygen do not apply to rinsing the wound with nascent oxygen. This is the best mechanical cleansing method at our disposal to date, and does no harm where the oxygen can escape freely.

112. **Preventive Injection of Antitetanus Serum.**—Wolf relates that after the German authorities decreed that every wounded soldier is to be given a preventive injection of antitetanus serum, the number of cases of tetanus dropped off to almost zero. In one case tetanus developed thirty hours after the injury, notwithstanding the preventive injection. Although the incubation was so brief the tetanus ran a very mild course. There is every reason to assume that without the preventive injection this case would have terminated fatally. The experiences related indicate that the preventive injections are an almost certain protection against lockjaw; also that the injection need not be made at once; even delay till the next day does not detract from its efficacy. It is not necessary, he adds, to give the preventive injection to every wounded man; it is enough to give it after shrapnel

and grenade wounds. When there are a number of scattered wounds, soiled with horse manure, the foci of infection being numerous the patient requires a double dose of the antitetanus serum.

Wiener klinische Wochenschrift, Vienna

XXVIII, No. 25, pp. 665-696

115 General Principles for Treatment of the Wounded. (Wundbehandlung in den Kriegsspitälern.) L. R. von Ruediger.
116 Ergot and Tetany. (Weiteres Material zur Sekaleatiologie der Tetanie.) A. Fuchs and R. Wasicky.
117 Vaccination against Bacillary Dysentery. (Zur Schutzimpfung gegen Bazillenruhr.) F. Lucksch.
118 Exposure to Direct Sunlight as Favorable Therapeutic Measure in Typhus. (Verhalten des Flecktyphus bei direkter Sonnenbestrahlung.) H. Wertheimer.
119 Typhus a Form of Typhoid. S. Rossberger.
120 Suggestions for Prophylactic Measures against Venereal Disease as Men are Dismissed from Military Service. O. Sachs and B. Lipschütz.

No. 26, pp. 697-724

121 Experimental Studies on Variola. J. Kyrle and G. Morawetz.
122 Infected Wounds of Bones and Joints. W. Denk.
123 Favorable Effect of Normal Horse Serum in Treatment of Typhus. R. Roubitschek.
124 Stock Vaccine Treatment of Typhoid. (Heterovakzinebehandlung des Typhus abdominalis.) F. Lucksch.
125 The Louse Question. E. v. K. Lenz.
126 The War and Social Insurance in Hungary. (Der Krieg und die ungarische Arbeiterversicherung.) H. Pach.
127 Heat-Stroke and Sun-Stroke. (Hitzschlag und Sonnenstich.) E. Wiener.
128 Suggestion to Add Stain to Vaccine, Blue for Typhoid, Red for Cholera. (Markierung der Typhus- und Cholera-Schutzimpfungen.) H. Hültl.
129 Wounds of the Brain. (Zur Chirurgie der Schussverletzungen des Gehirns.) Frey and H. Selye.

Zeitschrift für Kinderheilkunde, Berlin

July 26, XIII, Nos. 1-2, pp. 1-128

130 *Tuberculin Treatment of Children. H. Koch.
131 *The Initial Fever of Tuberculosis. H. Koch.
132 Anomalies in the Blood of the Prematurely Born and Weakly Children. (Zur Kenntnis der Blutveränderungen bei Frühgeburten und debilen Kindern.) D. Kunckel.
133 Interlobar Pleurisy in Children and the Roentgen Findings. F. Weihe.

130. **Tuberculin Treatment of Children.**—Koch is assistant at the children's clinic at Vienna in charge of von Pirquet, and he here gives a detailed description of forty-five children given systematic courses of tuberculin treatment. He reports excellent and encouraging results, but emphasizes the changes he has introduced into the method of tuberculin treatment for children. He gives the tuberculin in a larger amount of fluid than others use, up to 10 or 20 c.c., believing that the tuberculin diffuses better in this way. He also changes the site of the injections, and increases the doses by geometrical progression. Only two strengths are required, 1:100,000 and 1:10,000. He begins with $\frac{1}{4000}$ mg. and increases to the final dose at 1,000 mg. This is reached usually in seven, thirteen or twenty-five doses, giving two injections a week. He adds that the terminal dose can be repeated as long as it seems necessary to continue the course. In seven cases the treatment had to be discontinued as periods of high fever set in. All the other little patients bore the treatment well and improved under it. The children were of all ages, but most were between 3 and 9. The most unfavorable age for the treatment is the first three years, and the eleventh, thirteenth and fourteenth years. The duration of treatment averaged only eleven weeks.

131. **Initial Fever of Tuberculosis.**—Koch relates that he had three children under observation who developed tuberculosis under his eyes, the exact date of their exposure to contagion being known. The children were tested regularly for the skin tuberculin reaction afterward. The response became positive at the same time that fever developed and kept up, and this was in each case during the seventh week after infection. The initial fever was the only clinical sign that anything was wrong, but from the first it displayed the characteristics of the fever of tuberculosis.

Zeitschrift für Urologie, Leipzig

IX, No. 7, pp. 241-280

134 The Urine in Diagnosis. (Zur Entwicklung der klinischen Harndiagnostik in chemischer und mikroskopischer Beziehung.) E. Ebstein. Concluded in No. 8.
135 Urology and the War. II. H. Lohnstein.
136 Fistulas, Abscesses, Pyuria and Bacilluria as Complications Following Nephrectomy for Tuberculosis. T. Verriotis.

Gazzetta degli Ospedali e delle Cliniche, Milan

September 29, XXXVI, No. 66, pp. 1025-1040

137 *Cholera Traced to the Market Place. (Se e come un mercato possa essere o divenire centro o veicolo d'infezione colerica.) M. Cioseffi.
138 *Case of Simple Traumatic Polyuria. A. Cardarelli.

137. **Epidemic of Cholera.**—Cioseffi relates that at Trieste nineteen cases of cholera developed at scattered points throughout the city, all in the course of ten days, and with no apparent connection between the cases. There were thus several remote foci. The water, milk, and similar sources of infection could be excluded, the only tenable explanation being that some carrier had been in the central fruit and vegetable market, and had infected some of the fruits and vegetables by handling them. The populace has been educated by the authorities to cook fruits and vegetables and eat none raw, so that infection could not have occurred from uncooked fruits or vegetables. The dealers, however, handling the goods, thus became infected secondarily, and carried the infection home. Some person connected with the market or working nearby was discovered in the environment in all the cholera cases.

138. **Traumatic Polyuria.**—In the case reported by Cardarelli a boy of 15 fell from a height of nearly 50 feet and suffered several fractures, and concussion of the brain. For twenty days he was unconscious or delirious, and not until after the fortieth day was the brain working apparently normally once more. He had much headache and thirst and voided from 17 to 18 liters of urine in the twenty-four hours. The traumatism seems ample to explain the polyuria, and under treatment with hypophysis extract the youth seems to be improving. The urine voided does not total over 8 or 9 liters now. Cardarelli thinks that it is not necessary to incriminate hysteria in this case although hysteria is often responsible for transient polyuria. He saw a case not long ago in which a young woman with pronounced stigmata of hysteria voided 22 liters of urine. In another case a boy of 11, after a severe fright, passed no urine for four weeks although apparently entirely healthy, and the anuria then stopped as suddenly as it had begun.

Policlinico, Rome

October 3, XXII, No. 40, pp. 1333-1364

139 Precipitation by Heat a Diagnostic Reaction in Bacillary Dysentery. A. Missiroli.
140 *Reciprocal Action on Each Other of Microbian Toxins. Mahokian. *October, Medical Section, No. 10, pp. 455-480.*
141 *Acute Raynaud's Disease Accompanying Paralysis. R. Alessandri and G. Mingazzini.
142 *Multiple Myelomas with Bence-Jones Albumosuria. (La malattia di Kahler-Bozzolo con illustrazione di un nuovo caso.) A. Martiri. To be continued.

140. **Interaction of Microbian Toxins.**—Mahokian reports experiences showing that tetanus and diphtheria toxins influence each other, the former attenuating the action of the latter when injected into guinea-pigs. On the other hand, diphtheria toxin enhances the toxic action of tetanus toxin. When tetanus toxin was injected along with diphtheria antitoxin, the curative influence of the latter was enhanced, but the exact opposite was observed with antitetanus serum. Microbes seemed to acquire greater virulence when some of their own toxin, and sometimes an alien toxin, was added to the culture medium. Experiments with the toxin from leprosy bacilli and from tubercle bacilli gave results suggesting that the secretions of the former were less diffusible than of the latter, which might be one reason why the former is harder to cultivate.

141. **Acute Raynaud's Disease Associated with Paralysis.**—Alessandri and Mingazzini encountered a number of cases of this kind among persons injured in the last great earthquake in Italy. Six of the patients died; in three the disturbances progressed to gangrene compelling amputation. The other patients recovered more or less completely

although the paralysis persisted in most. Trophic vasomotor disturbances were evidently the main factor in some cases and acute inflammation of peripheral nerves in others. The latter group is much less serious. All the patients had been buried under the ruins for from one to three days, exposed to cold, wet and fright.

142. **Multiple Myelomas.**—Martiri reviews the literature on the syndrome described by Kahler and first diagnosed in the living subject by Bozzolo. He has compiled 204 cases and adds another to the list. His patient was a man of 55, a great smoker and drinker, who developed occipital headache in 1913, subcontinuous, a little worse at night, with occasional dizziness, all improving under treatment for neuralgia. A few months later pains and tenderness in the right ribs became so intense that the man could not get up for a few days, but they gradually improved although the pains could be elicited anew by bending the trunk. Later, pains in the knee prevented walking. A tumor could be felt on the sternum, painful on pressure, but there was never any fever. The urine contained from 0.15 to 1 per thousand Bence-Jones bodies, and the diagnosis of Kahler-Bozzolo's disease was confirmed by the practically spontaneous rupture of the femur. The course was progressive, the man dying in coma about a year after the first symptoms. The variability of the seat of the pains from day to day is a striking feature of this disease, but the pains always cling to the bones, and nocturnal exacerbations are common. In some cases the complaints seemed to be so out of proportion to the slight objective findings that simulation was suspected. The discussion of the disease, of the Bence-Jones albumose and its determination, etc., fill thirty pages in this installment of Martiri's article.

Riforma Medica, Naples

October 2, XXXI, No. 40, pp. 1093-1120

143 *Pathologic Obesity in Two Infants. (L'obesita mostruosa nei bambini lattanti.) L. Ferrannini. Commenced in No. 39.
144 Catalase in Organs with an Internal Secretion. F. Galdi.

143. **Extreme Obesity in Infants.**—In this concluding half of his article Ferrannini summarizes his conclusions in the statement that disturbances in the glands with an internal secretion are undoubtedly responsible for pathologic obesity in infants, as at any age. The influence of the nervous system and of infections and intoxications is felt through structural or functional changes or both in the glands with an internal secretion. In the two cases of which an illustrated description is given, probably more than one of these glands was involved as the syndrome was extremely pronounced and complex. The pancreas and the thyroid can probably be excluded as also the genital glands, on account of the age of the little patients. The pituitary body, the pineal gland and the suprarenals are probably the ones involved, the last two only secondarily.

Russkiy Vrach, Petrograd

XIV, No. 34, pp. 793-816

145 Treatment of Poisoning with Asphyxiating Gases. V. I. Skvorzoff.
146 War Psychoses. S. A. Soukhanoff.
147 *Cultivation of Cholera Germs from the Feces. N. I. Krich.
148 *Heterogenous Hemolytic Serums. I. L. Krichevsky.

No. 35, pp. 817-840

149 Operative Treatment of Habitual Luxation of the Humerus. L. G. Stukkey.
150 *Wounds Caused by Earth. S. L. Timoffieff.
151 Draining of Wounds. V. N. Novikoff.
152 Splint with Extension in Fractures of Humerus. A. T. Berdiaeff.
153 *Acute Necrosis of Pancreas. V. P. Nedokhleboff.

147. **Cultivation of Cholera Vibriones.**—Krich found Ottolenghi's medium for cultivation of cholera vibriones more suitable than pepton-water. Fresh ox gall is filtered through paper and then 3 c.c. of the filtrate is mixed with 100 c.c. of 1:1,000 solution of soda crystals and 1:1,000 of potassium nitrate. The mixture is placed in test tubes and sterilized at 115 C. for fifteen or twenty minutes. Krich had the opportunity of studying this method on cholera patients simultaneously with the pepton-water medium. The parallel experiments showed the advantages of the gall medium. The latter would produce a luxuriant growth of cholera vibriones when the pepton-water medium would show no growth whatever. The technic was as follows: 1 c.c. of feces was placed in a glass with 30 c.c. of alkaline gall prepared according to Ottolenghi. Six or twelve hours later a reinoculation was made on slanting agar, rendered solid by addition of 1.5 per cent. of agar to 10 c.c. of gall. The specimens were stained with acid fuchsin, after fixation in an alcoholic solution of mercuric chlorid, or a 1:1,000 solution.

148. **Hemolytic Serums.**—Krichevsky showed that the connective tissue of animals, as for instance, the fat of a guinea-pig, contains an antigen which produces a hemolysin against sheep red blood corpuscles. The cause being in the nuclei, he concluded that nucleated erythrocytes, which are found in a hen, for instance, should also possess this ability of producing hemolysins against sheep erythrocytes. As the organs of a hen contain such an antigen, he chose the erythrocytes of this animal for his experiments. They were injected into rabbits and the latter's serum proved afterward hemolytic for sheep red cells. Therefore he comes to the conclusion that the hen's erythrocytes contain the same heterogenous antigen—which produces hemolysis of sheep cells—as the organs. The obtained heterogenous serum possesses high hemolytic properties; 1,000 hemolytic units in 1 c.c. for sheep cells, but it is inactive against the cells of the hen that gave the antigen. Therefore, Krichevsky thinks that specificity of antibodies does not exist, because rabbits injected with hen's red cells produce a hemolysin not against the latter, but against sheep cells. However, the serum of a hen contains agglutinogens as shown by the fact that immunization of rabbits generates in their serum a large amount of agglutinins against the erythrocytes of hens. Thus, the erythrocytes of the latter contain not only heterogenous hemolysins, but also heterogenous agglutinins. The experiments also showed that rabbit's serum immunized by hen cells does not contain hemolysins against beef erythrocytes either, and that the connective tissue of animals (guinea-pig, for instance) contains a heterogenous sheep antigen—rabbits injected with fat from a guinea-pig give a serum that dissolves the sheep erythrocytes.

150. **Wounds Caused by Earth.**—Wounds caused by earth are the by-effects of the action of projectiles. Exploding bullets and shells drive small particles of dirt into the skin. The neck, face and other exposed portions of the body are usually affected. The mildest form is "tattooed skin" which appears as if covered with dirt which cannot be removed either with soap or benzin, as the smallest particles of the dirt have been driven into the skin. It becomes swollen, parchment-like, and either peels or small necrotic foci form. Venous thrombi sometimes develop. With the second form, abrasions with cyanosis and swelling, deep necrosis may occur or thrombophlebitis. The third variety is the formation of real wounds with irregular edges and subcutaneous hemorrhages; the wound is full of pieces of earth, stones or dirt. In one case one and a half pounds of dirt were found in the wound. Such wounds may be the cause of general sepsis. Earth wounds may be complicated with brain concussion, fractures of bones and contusion of viscera. In milder cases there may be dizziness, headache, general pallor or redness of the face, neck and chest. In other cases the explosion caused psychic disturbances. In all he had forty-five cases of "dirt wounds" among 2,000 patients (2.25 per cent.). The wounds are superficial, but badly infected. The treatment, therefore, consists in prevention of sepsis. By the sixth or ninth day as a rule the soldiers wounded in this way could be sent back to the interior without danger.

153. **Acute Necrosis of Pancreas.**—Nedokhleboff advocates early operative treatment of acute necrosis of the pancreas. It can be diagnosed by the following symptoms: adipositas, sudden onset with a severe shock, stormy course, localization of pain in the epigastrium, meteorism in the region of the stomach, absence of muscular defence, prolonged vomiting of bile, the contrast between the collapsed state and the good pulse, cyanosis and dyspnea without corresponding changes in the heart and lungs. All these symptoms were present in a case reported in detail. This patient was a 19 year old girl who recovered after a successful operation.